

Exploring the Role of Grocery Stores in Preventing Food Waste in the U.S.

Undergraduate Research Thesis

*Presented in partial fulfillment of the requirements for graduation with research distinction in
Visual Communication Design in the undergraduate colleges of The Ohio State University*

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The Ohio State University
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What to Expect

2019 – Senior Design Thesis

Research Food Waste & Consumers' Mindsets

Identify Opportunities

Design the Solution: Ginger

2020 – Research Distinction Work

Research the Grocery Industry

Identify Opportunities

Design a Floorplan

Create a Graphic Location Plan for Signage



PRELIMINARY RESEARCH

Researching the Problem

I set out to learn the **facts about food waste** in the United States and to understand **consumers' current mindset about food waste** through the following research methods:



Secondary Research



**Participant Tracked
Food Waste Journals**



**Follow-up
Interviews**

This section will share the findings of my research

40% of food produced for human consumption gets thrown out, making food waste the **#1 contributor to U.S. landfills**

45% of all
fruit + vegetables

35% of all
fish + seafood

30% of grains

20% of meat +
dairy products



On average, one person throws out
400 pounds of uneaten food each year,
costing them about **\$450 annually**.





Wasting Food Wastes Everything

Water, land, fertilizer, energy, labor and many other **resources are used in vain** for growing, harvesting, transporting, processing, and storing food items.

Wasted resources due to uneaten food costs the U.S. about **\$218 billion each year**.



If we could redirect **one-third of food waste** to people in need, it would **more than cover unmet food needs** across the country.

The Cause of Food Waste

43% of all food waste is caused by **consumer households** due generally to one or more of these six reasons:



General Lack of
Awareness



Impulse and
Bulk Purchases



Confusion Over
Food Safety



Poor Planning



Poor Storage



Overpreparing
Food at Home



Who are the Consumers?

Gen Z are the consumers of the future. They have an estimated spending power of \$44 billion as they enter the workforce.

These younger generations value the planet, desire to make a positive impact and are willing to get involved.

Gen Z considers price, aesthetic and convenience as the top drivers when purchasing food.

ISSUE: *Cheap, convenient food promotes behaviors that undervalue fully using purchases*

Consumer Personas

I created **three consumer personas** based off of my research to define how people have different **desires and frustrations** when grocery shopping.



Busy Saver



Supporter



**Conscious
Consumer**



"I crave a variety of meals, but I don't have time to find new recipes or plan groceries"

Weekly Grocery Bill

\$50

Sustainable Values



Motivations

- Save money and time
- Expand his taste-palate

Often Eats Out



Busy Saver

Meet Joey!

When Joey began living on his own, he **started cooking** for himself. His busy school schedule and college budget makes it difficult for him to plan unique, healthy meals for the week. Joey **often buys in bulk** to try to save money and time planning what to eat. However, he often gets bored eating the **same meal every day**, and began losing money from throwing out excess leftovers.

Frequently cooks for





Supporter

"It is difficult to accommodate my entire family without breaking the budget"

Weekly Grocery Bill

\$260

Motivations

- Save money on healthy food
- Accommodate different diets

Sustainable Values



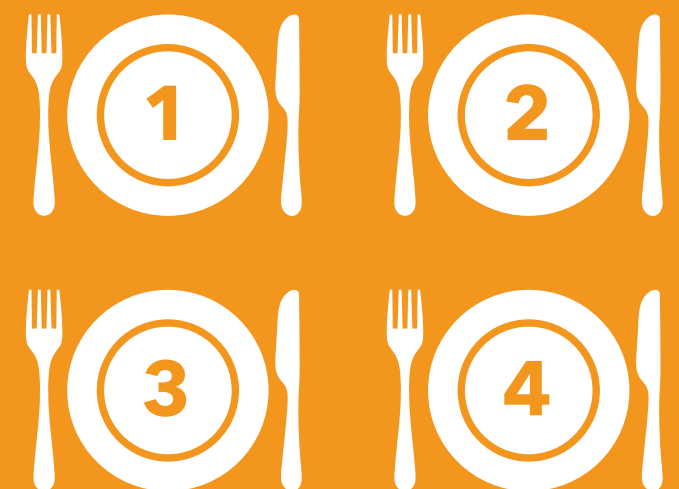
Sometimes Eats Out



Meet Mindy!

Mindy's grocery bill often is **exceedingly expensive** because she must buy extra food to accommodate her picky toddler, gluten free son, and vegetarian husband. With everyone on **different diets**, her household often can't make it through everything before the **food spoils**. Mindy is frustrated by the amount of money she wastes each week on groceries.

Frequently cooks for





Conscious Consumer

"I want to feel confident that I am doing the best thing for my planet and community"

Weekly Grocery Bill

\$105

Sustainable Values



Motivations

- Make a difference environmentally
- Give back to the community

Rarely Eats Out



Meet Owen!

Owen and her girlfriend are **environmentally conscious** when it comes to the brands they support. Owen always makes an extra effort to **shop locally** at farmer's markets. She spends hours each week looking up recipes and storage tips that allow her to use the food she buys to its full potential. Owen wishes she could use her time to **make a difference** instead of planning her schedule.

Frequently cooks for





IDENTIFYING OPPORTUNITIES

Current User Journey

Using my research, I created the current grocery shopping user journey to identify current pain points and opportunities.



Design Opportunities

Meal planning during the shopping experience, not before.

A grocery store could provide recipe inspiration and meal portioning education through self-building meal building stations that reduce packaging and lower prices.

Organizing grocery lists by ingredient quantity and aisle location.

Recipes could be added to a digital grocery list with ease. Recipes would be broken down by aisle location and ingredient quantity for convenience and more conscious shopping.

Maintaining partnerships with local vendors and food banks.

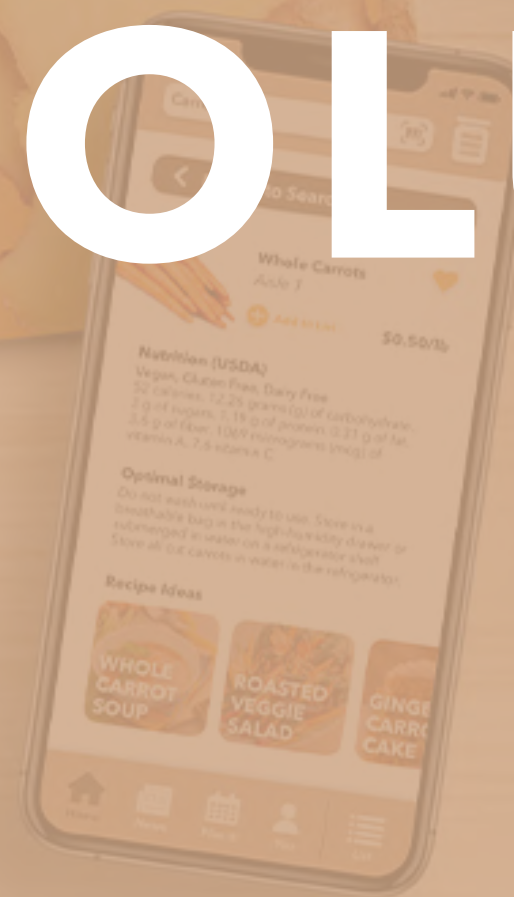
Employees could work with local vendors to provide fresh produce to consumers and return nutrient-rich, composted soil back to their farms. Employees could also donate nearly-expired, safe food to local food banks to ensure the products get used to their fullest potential.

Educating a community

A brand system that could educate their consumers on meal storage techniques and clarify the taboos of date labels to create more awareness about food safety and limit food waste.



THE SOLUTION



Meet Ginger!

a store rooted in responsible food use

Ginger is an environmentally conscious grocery store focused on thoughtful shopping. The store encourages and simplifies meal planning, educates shoppers on food waste's environmental impacts and gives back to the food insecure population. This niche grocery store allows consumers to focus on meal planning during their shopping experience to instill good habits that inherently limit individual food waste.

Design Principles

The new store concept is based on the following three principles:



To Reduce

Educate consumers about the impacts of food waste to empower a community of like-minded people. Design a grocery store system that enhances thoughtful shopping.



To Inspire

Provide tips on how to properly store and revive food. Teach customers about new recipes that use food to its fullest potential. Share what others are doing in the community to combat food waste.



To Give

Donate nearly-expired food to local resource ministries through volunteer and employee programs. Compost spoiled produce and return nutrient-rich soil back to the store's vendors.

Ginger's New User Journey

The new consumer user journey for the shopping experience at a Ginger Store.



Ginger's Employee Journey

Additionally, the Ginger employee journey reduces food waste in store.

Before Open



Stock meal stations with a variety of inclusive options



Rotate meal stations based on seasonal, local produce

During Hours



Move rotten produce to compost bins in the back



Collect nearly-expired food to donate to local food banks

After Close



Give composted, nutrient-rich soil back to local vendors

Ginger's Design System

The design-system includes a developed brand, publication and app that work together to educate consumers about food waste, simplify meal planning, and encourage giving back to the food insecure.



The Brand

A recognizable brand system that inspires people to consistently make a difference in their communities. Ginger is more than a brand – it's a lifestyle!



The Magazine

Educates readers on the costs of food waste and how they can make a difference. Provides tips on how to store and revive food. Teaches customers recipes that use food to its fullest potential.



The App

Includes a food-search feature that provides information including best-storage and recipes and an interactive meal planning calendar and grocery list so customers can meal plan at home.



The Brand

The final mark is directly symbolic of a ginger root. While organic in shape, the mark remains simple, bold and unique. The five nubs of the ginger root represent the store's five values – education, inspiration, care, consciousness and generosity.

The asymmetric mark reminds customers that food grows in unique shapes and sizes – and all food waste warriors know that even ugly produce should be valued and respected!

The Brand Overview

Brandmark + Typographic Lockup



Color Palette



Typography

Avenir Next is the official typeface for Ginger. This simple, modern sans-serif has a smooth geometric appearance that complements the soft edges in the Ginger mark.

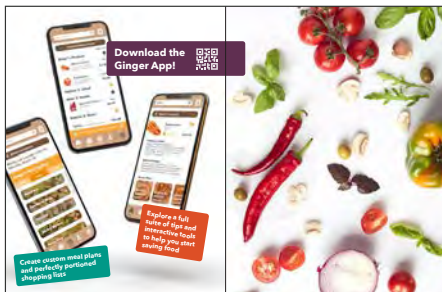
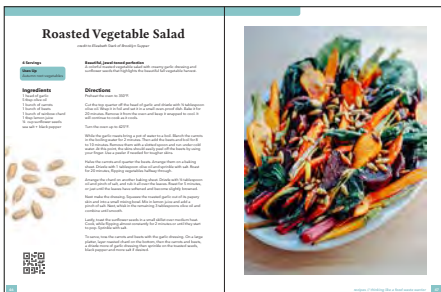
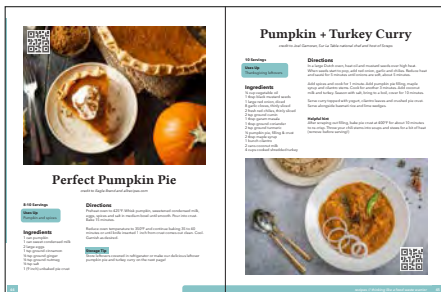
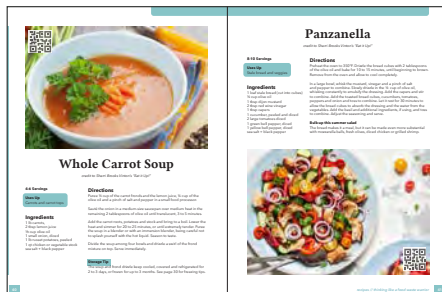
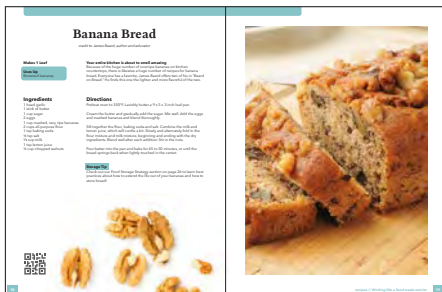
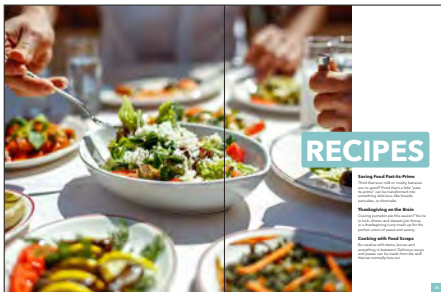
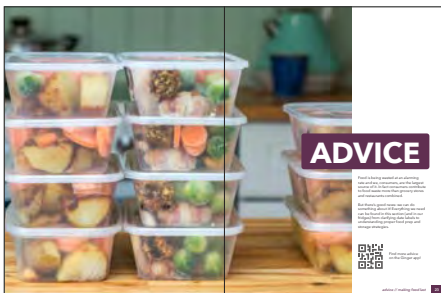
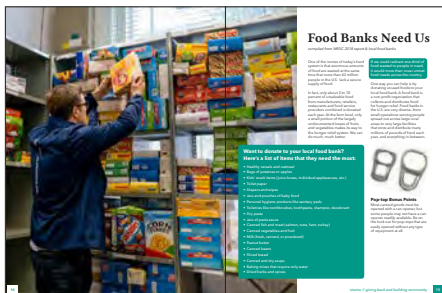
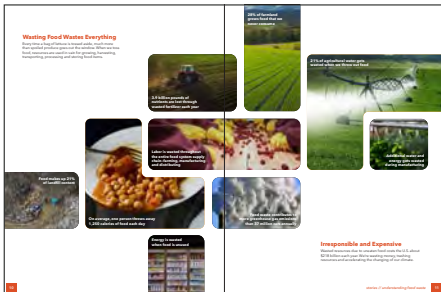
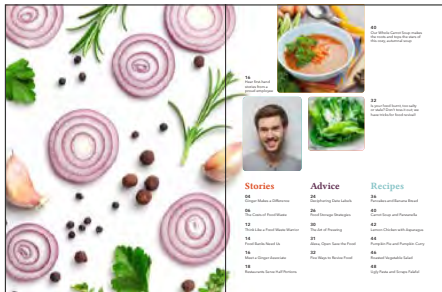
Linux Libertine is the secondary typeface for Ginger. This serif shows the brand's personality. It is reserved for important headings, titles and the typographic lockup.



The Magazine

The Live Ginger magazine was designed to educate readers on the costs of food waste and on how they can work to make a difference with their own food waste impact. The magazine provides easy tips on how to store and revive food. It also inspires customers with recipes that use nearly-expired foods and food scraps to their fullest potential.

The Magazine

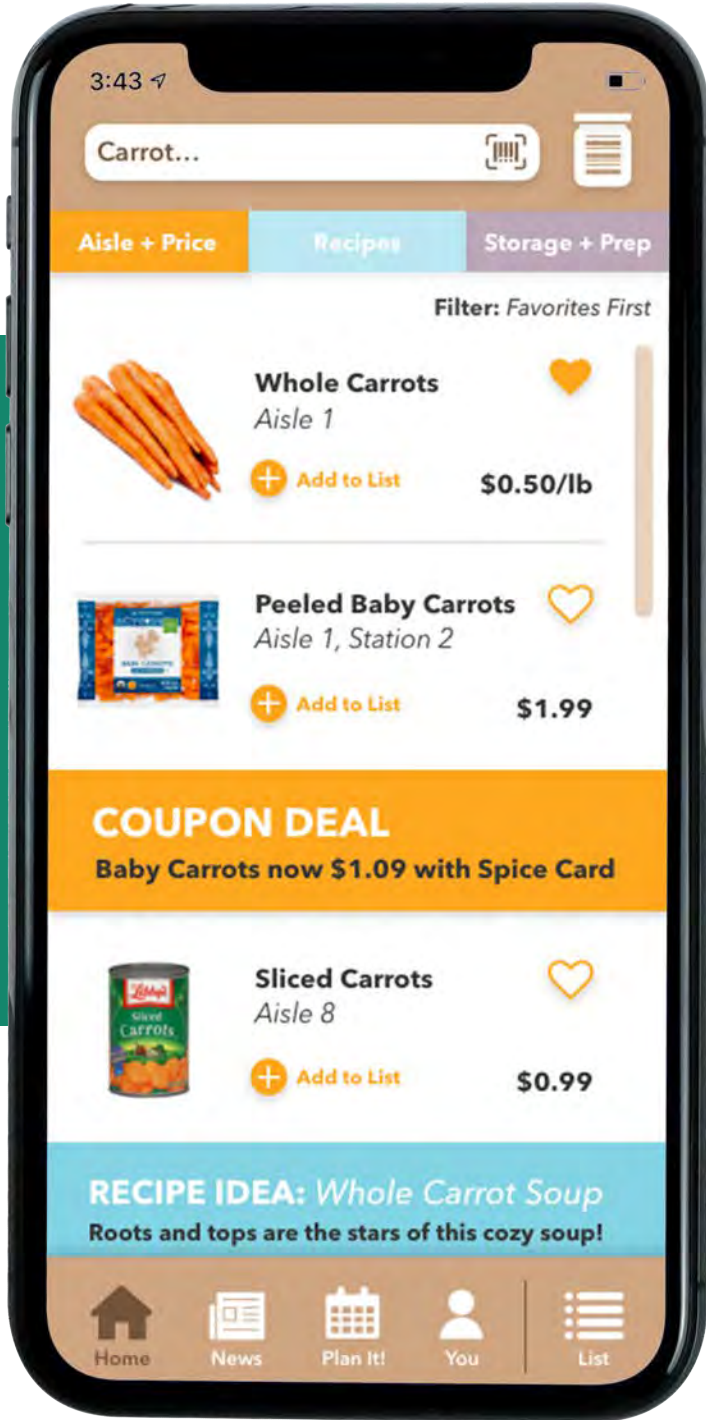
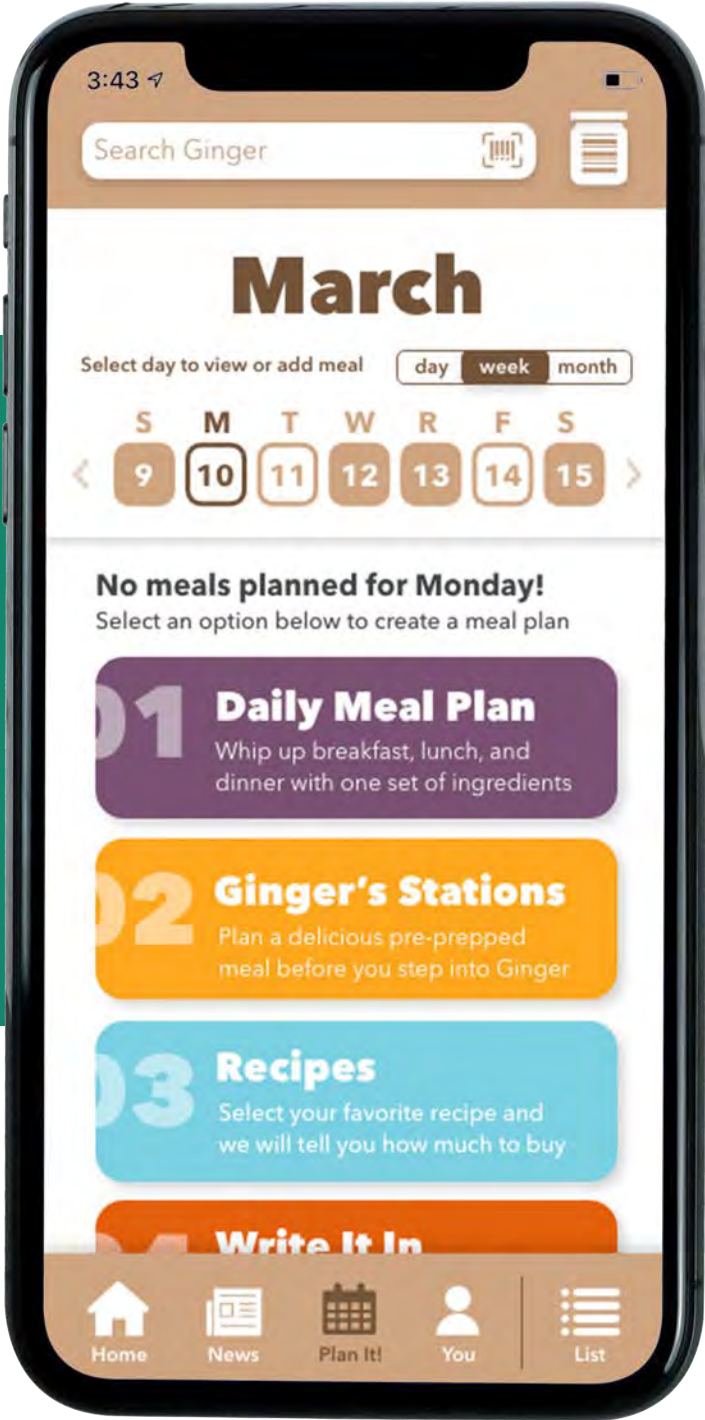




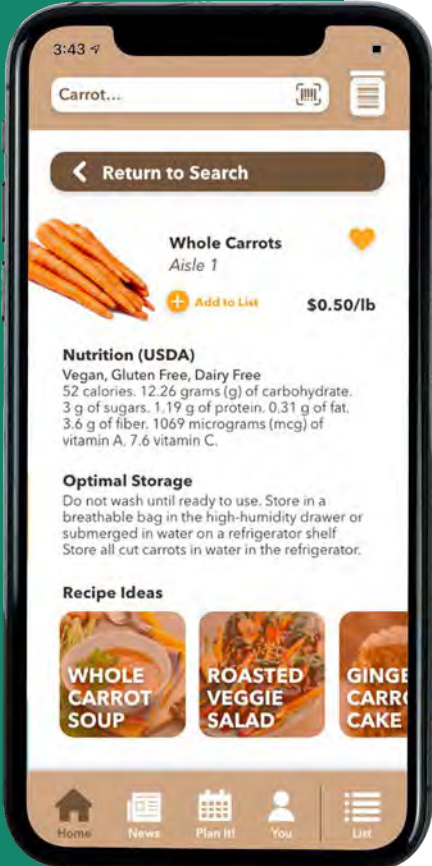
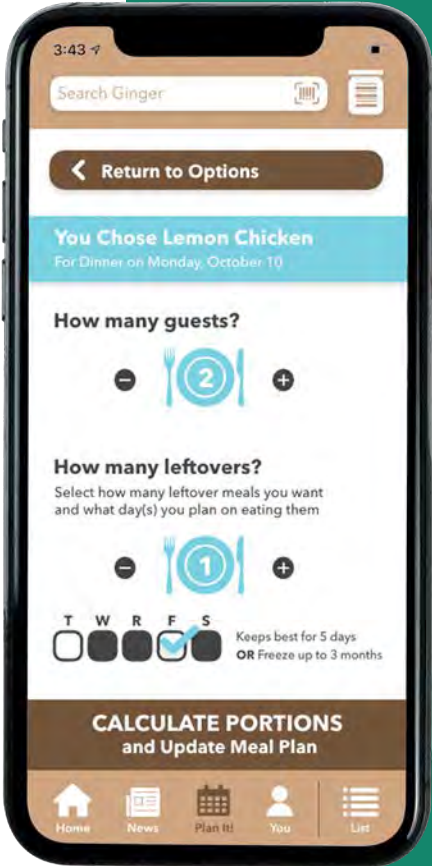
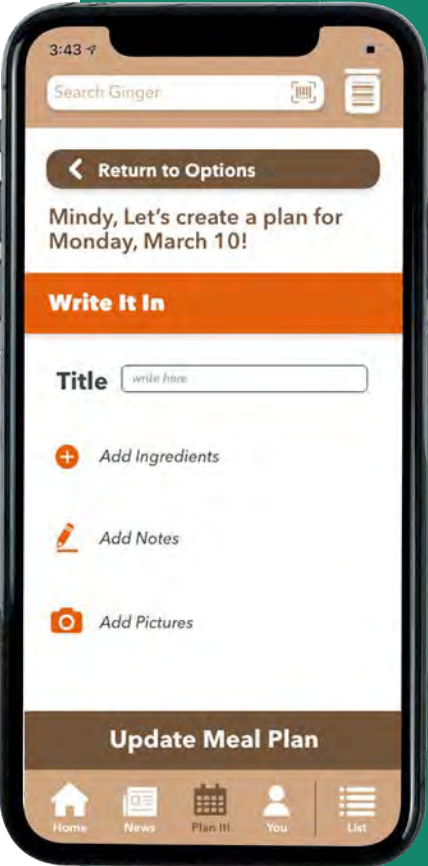
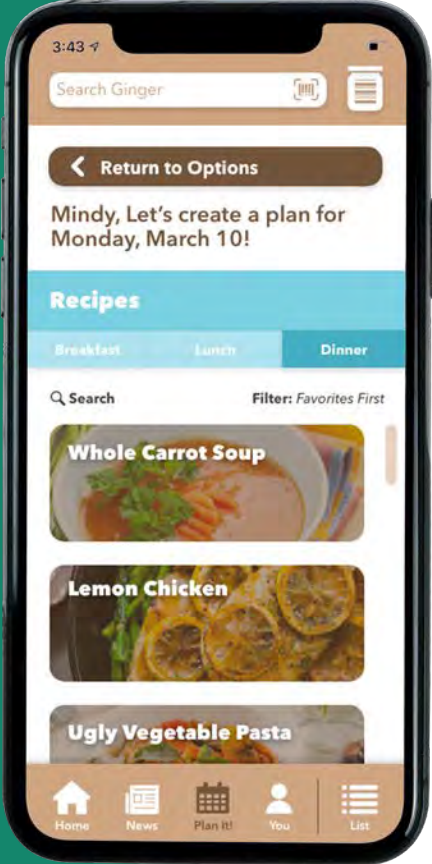
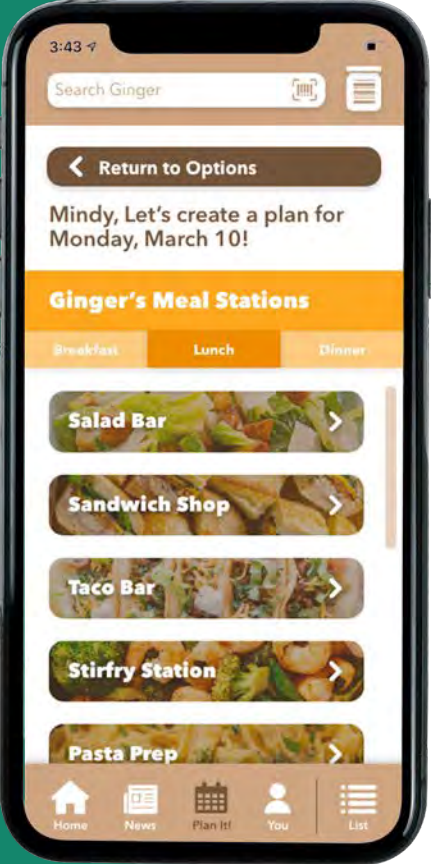
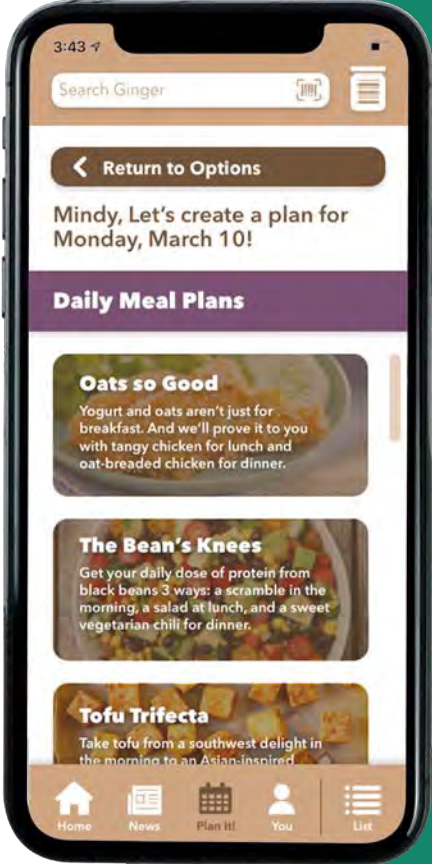
The App

The Ginger mobile app provides personalized inspiration throughout the customer's shopping experience. The app includes a food-search feature that provides information such as aisle location, nutrition, storage tips and a few recipes to make with the searched item. Shoppers can favorite meals and build their digital cookbook as they fall in love with new recipes. The app also includes an interactive meal planning calendar and grocery list so customers can choose to meal plan at home.

The App



The App





What about the Store?

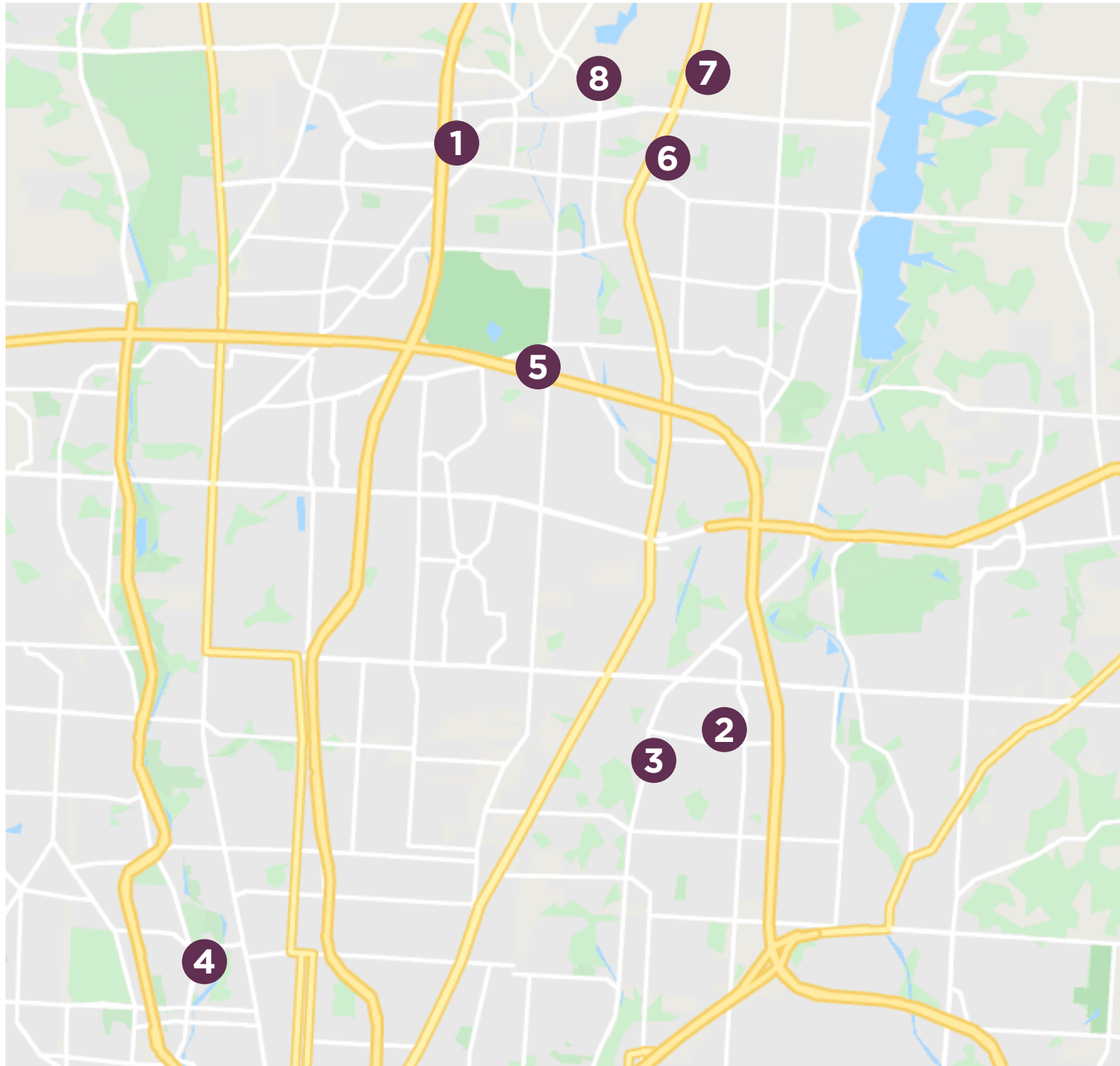
After designing the publication and app to educate and inspire consumers at home, I decided to take my research one step further and explore how a well-layed out **floor plan and in-store signage** could enhance Ginger's ability to reduce consumer food waste.

All research and deliverables up to this point was for a senior thesis requirement for The Ohio State University College of Design.

For my Research Distinction, I am taking my research a step farther to explore how the physical grocery store can be designed to educate consumers and reduce food waste.

INDUSTRY RESEARCH

Store Locations



STORES

1. Fresh Thyme - Polaris
2. Whole Foods - Easton
3. Trader Joe's - Easton
4. Lucky's Market - Columbus
5. Raisin Rack - Westerville
6. Giant Eagle - Westerville
7. Kroger - Westerville
8. Meijer - Westerville

FRESH THYME



BRAND MESSAGING



SIGNAGE QUANTITY



SIGNAGE PLACEMENT





OBSERVATIONS

- Intricate use of materiality + props
- Human moments and food samples
- Sketched/handwritten type style
- Use of wall graphics + awnings, barely any hanging signage
- Signage plays to emotion to build trust and speak to customer
- Emphasis on bulk and saving



WHOLE FOODS



BRAND MESSAGING



SIGNAGE QUANTITY



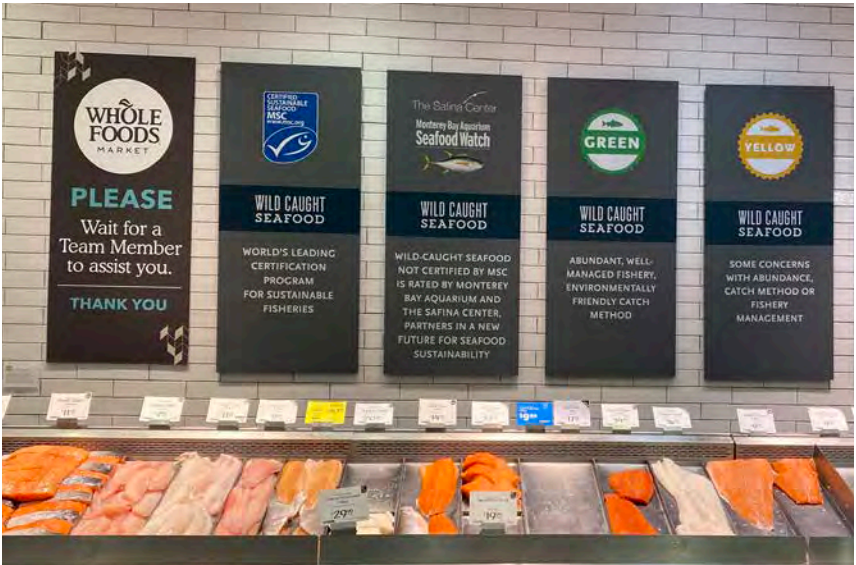
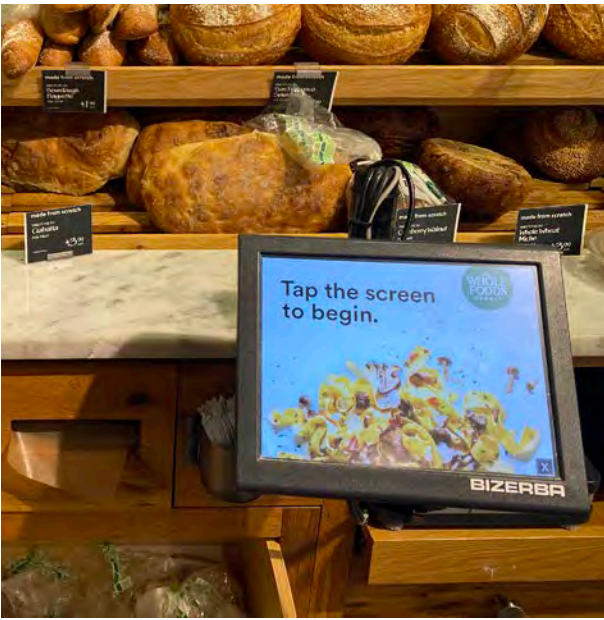
SIGNAGE PLACEMENT





OBSERVATIONS

- Human moments and food samples
- Use of biophilia and sensory experiences
- Push for transparency & sustainability through educational signage
- High ceilings, but low signage
- Distinct look and feel
- Went for handwritten look and local promotion... feels forced
- Strongest use of digital signage





TRADER JOE'S



BRAND MESSAGING

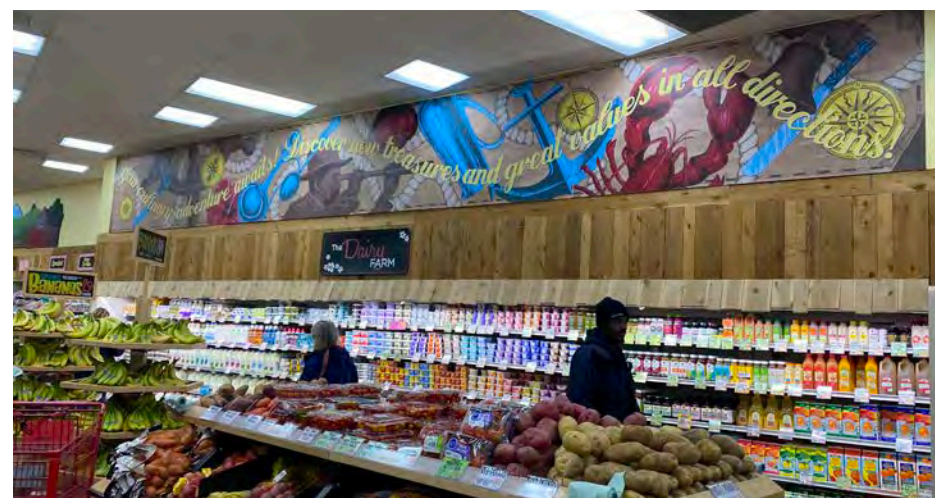
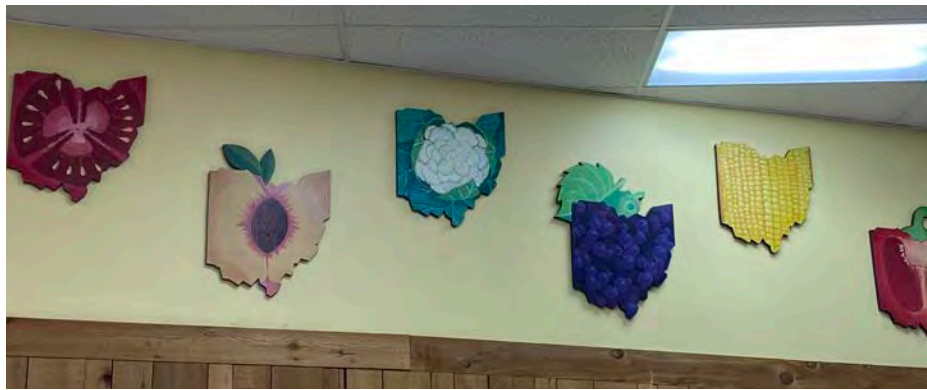


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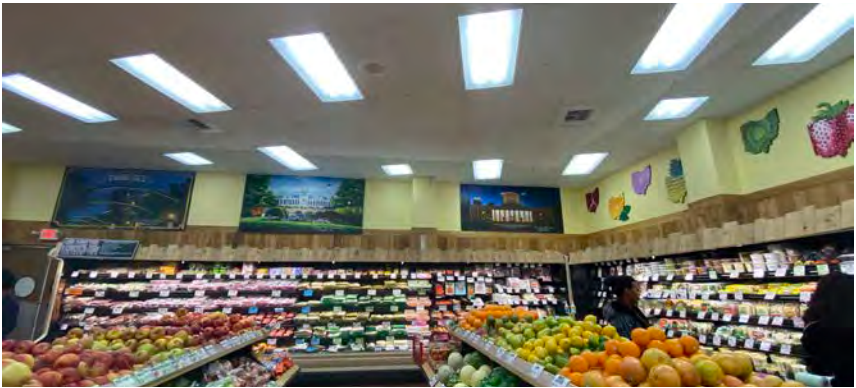
SIGNAGE PLACEMENT





OBSERVATIONS

- Hand written signage done by two in-house artists; they work on top of printed templates with sketchy-icons
- Descriptive informational signage (recommendations & education)
- Local art, OHIO emphasis
- No directional signage
- Human moments and food samples



LUCKY'S MARKET



BRAND MESSAGING

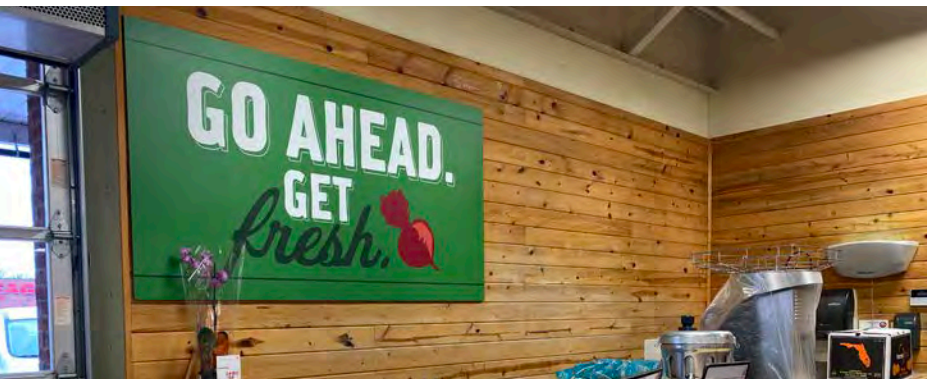
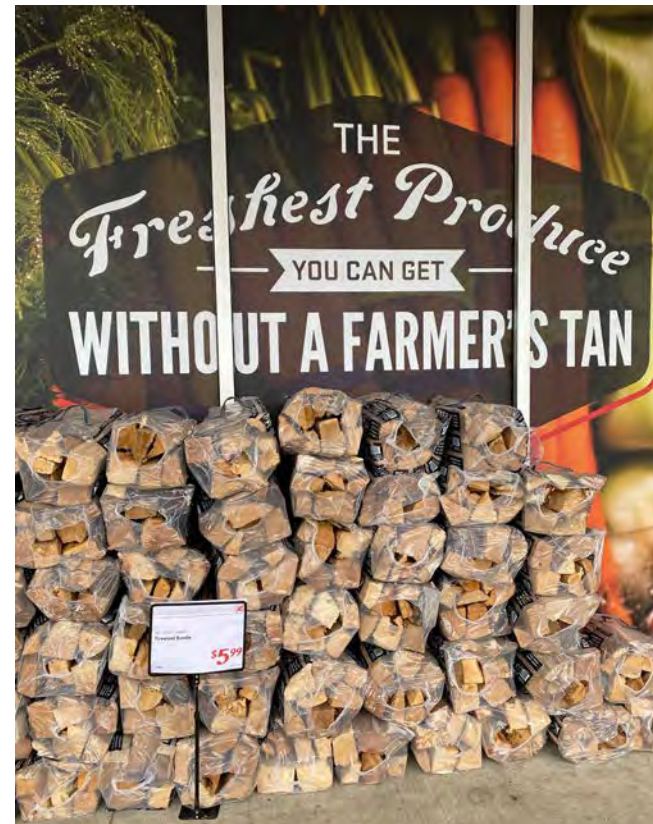


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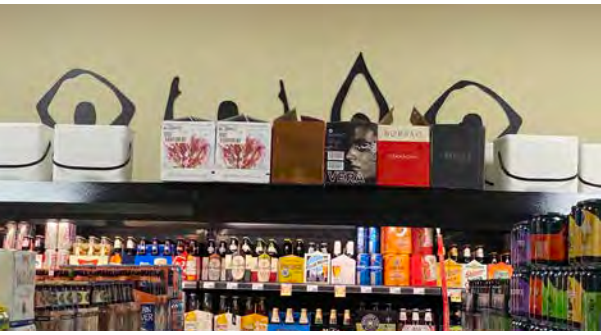
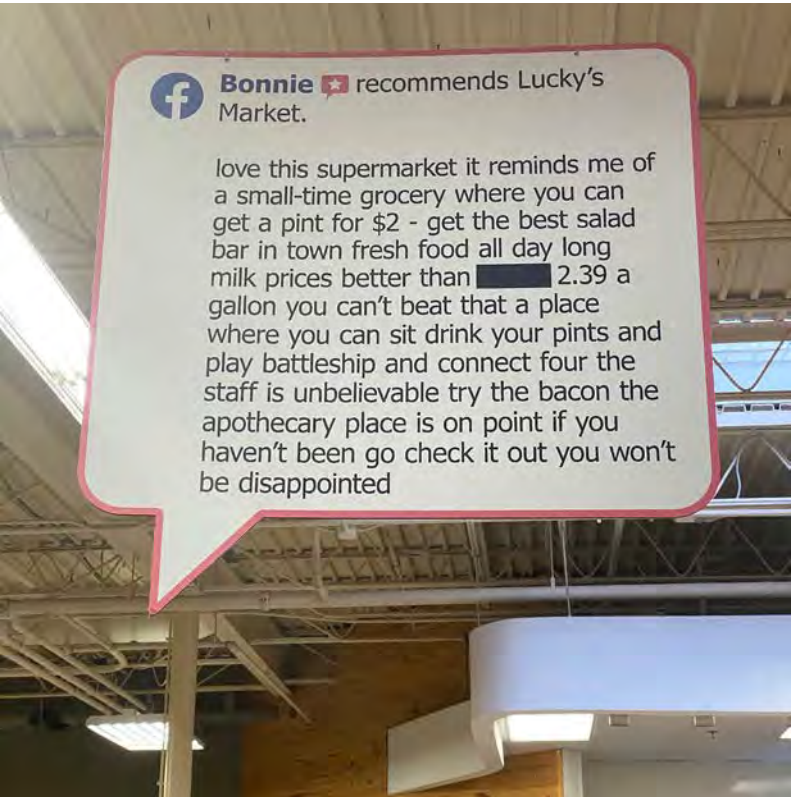
SIGNAGE PLACEMENT





OBSERVATIONS

- Uses brand mark on signage
- Developed "family & friend" atmosphere
- Emphasis of type and graphic elements
- Focus on local trust
- Established brand language
- A lot of signage is accidentally blocked



RAISIN RACK



BRAND MESSAGING

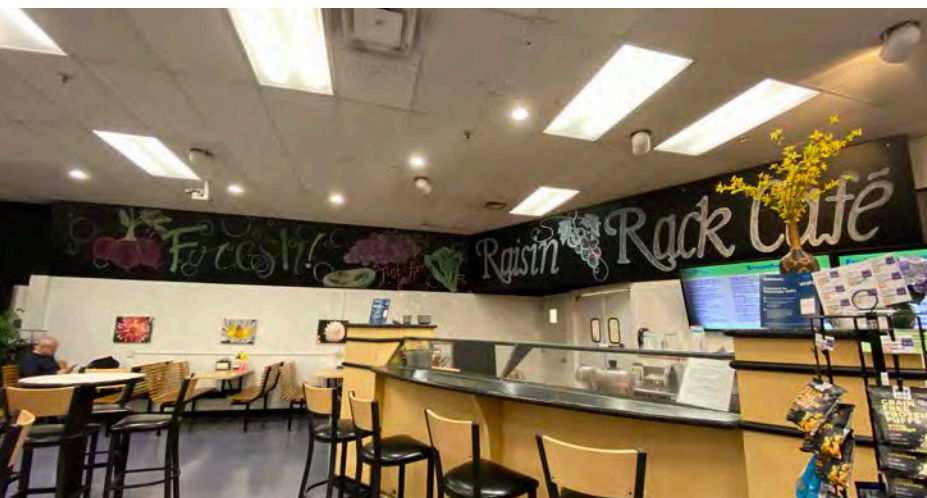


SIGNAGE QUANTITY



SIGNAGE PLACEMENT





OBSERVATIONS

- Signage overlap, unclear what signs pertain to what
- Awkward use of digital signage
- Some biophilia mixed with real + fake handwritten signage
- Oversized signage, non-informative
- Signage doesn't feel thought out



BRAND MESSAGING

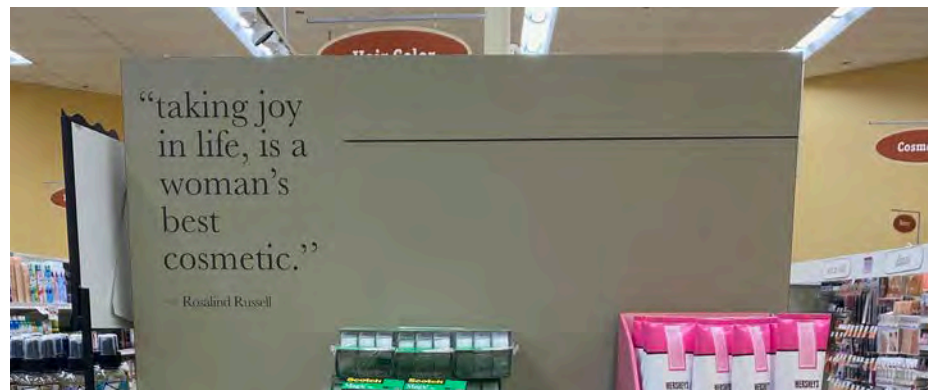


SIGNAGE QUANTITY



SIGNAGE PLACEMENT





OBSERVATIONS

- Color is used to divide product sections
- Logo is overused on nearly every sign
- They promote other brands more than they self promote
- Majority of signage was temporary
- Amount of signage is overwhelming
- No established brand language, signs just display information
- Many missed opportunities for brand moments and voice projection

GIANT EAGLE CHICKEN

Chicken Breasts fried 400 cal. roasted 270 cal.	2⁴⁹ _{ea.}	8-Piece Chicken*	7⁹⁹
Chicken Thighs fried 320 cal. roasted 250 cal.	1²⁹ _{ea.}	48-Piece Chicken* <small>May require up to a 48-hour advanced notice.</small>	46⁹⁹
Chicken Drumsticks fried 120 cal. roasted 70 cal.	1²⁹ _{ea.}	100-Piece Chicken* <small>May require up to a 48-hour advanced notice.</small>	95⁹⁹
Chicken Wings fried 120 cal. roasted 60 cal.	99^c _{ea.}	<small>*fried 440 cal. per 7 oz. roasted 350 cal. per 7 oz.</small>	
Chicken Tenders 140 cal. each	7⁹⁹ _{lb.}		

2,000 calories a day is used for general nutrition advice, but calorie needs vary. Additional nutrition information available upon request.

NEW!

fuelperks+

Get 100 bonus perks for watching our video at giantagle.com/perks

DISTINCTLY ORGANIC
Put Your Organic Products in Purple Bags!

SALE!
Organic Green Beans
12 oz. bag
2/\$7
card user pays

DISTINCTLY ORGANIC
Put Your Organic Products in Purple Bags!



GO FRESH MEAL KITS
WITH ORGANIC BEEF, GRAINS AND HERBS

GREAT TO GO
FROM MARKET DISTRICT

FRESH MEAL KITS

GIANT EAGLE

SALE!
10⁹⁹

MARKET DISTRICT

Chef-Created Soups

12 oz. \$3⁹⁹ _{ea.}	16 oz. \$4⁹⁹ _{ea.}	24 oz. \$6⁹⁹ _{ea.}
--	--	--

Self-serve Soups

Salad and

TEMPERATURE CONTROLLED

RESERVE WINE

in partnership with our communities to support environmental sustainability,

we encourage you to shop with reusable bags and you'll **earn 1 bonus** **per reusable bag used at checkout***

sustainability
it takes all of us

*Maximum of 10 bonus earned per reusable bag used at checkout per transaction. Limit 1 Bonus Only.



BRAND MESSAGING

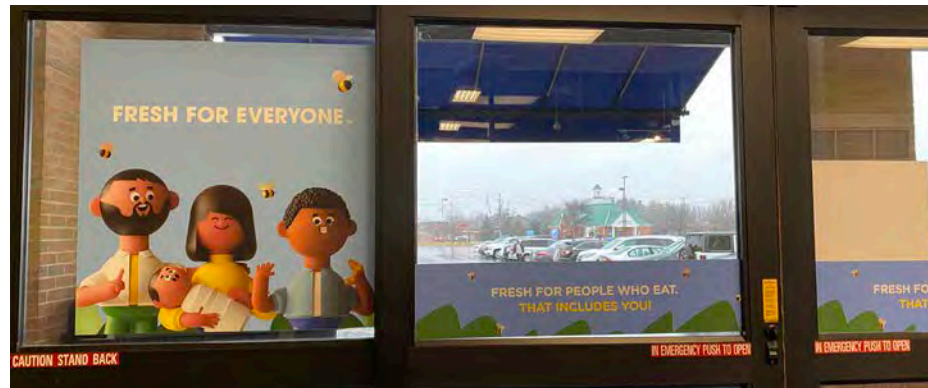


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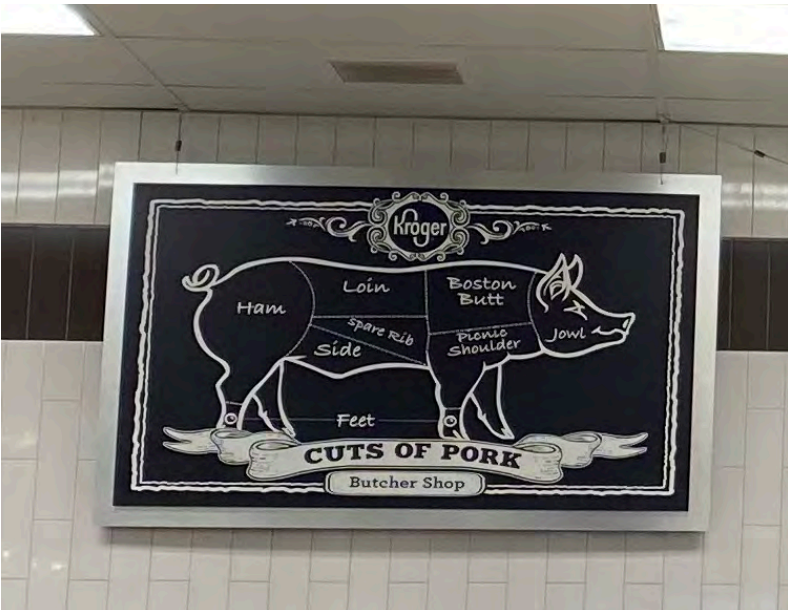
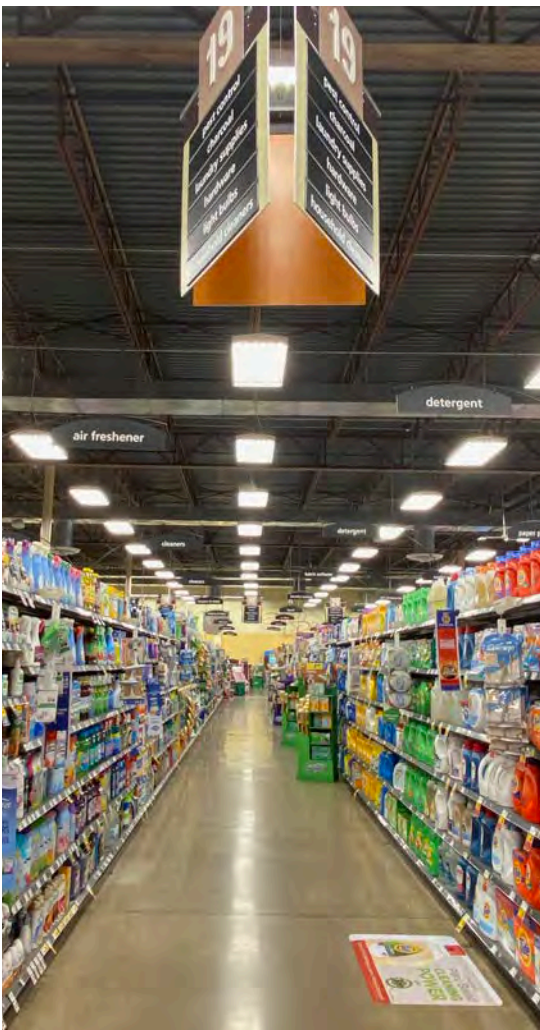
SIGNAGE PLACEMENT





OBSERVATIONS

- Use of floor, wall and hanging graphics
- Many branded moments
- Consistent, established language
- Included educational signage
- Emphasis on local to build trust
- Signage felt intentional + thought out





BRAND MESSAGING



SIGNAGE QUANTITY



SIGNAGE PLACEMENT





OBSERVATIONS

- Informational signage with photos
- Strong use of blue and symbol graphic; doesn't overuse logo
- No floor graphics and minimal hanging signage throughout open floor plan
- Color used with purpose, red = sale
- Established language



UNIQUE



PRODUCT
FOCUSED

PEOPLE
FOCUSED



EVERYDAY

UNIQUE



TRADER JOE'S®



Lucky's Market

PRODUCT
FOCUSED

PEOPLE
FOCUSED



meijer



EVERYDAY

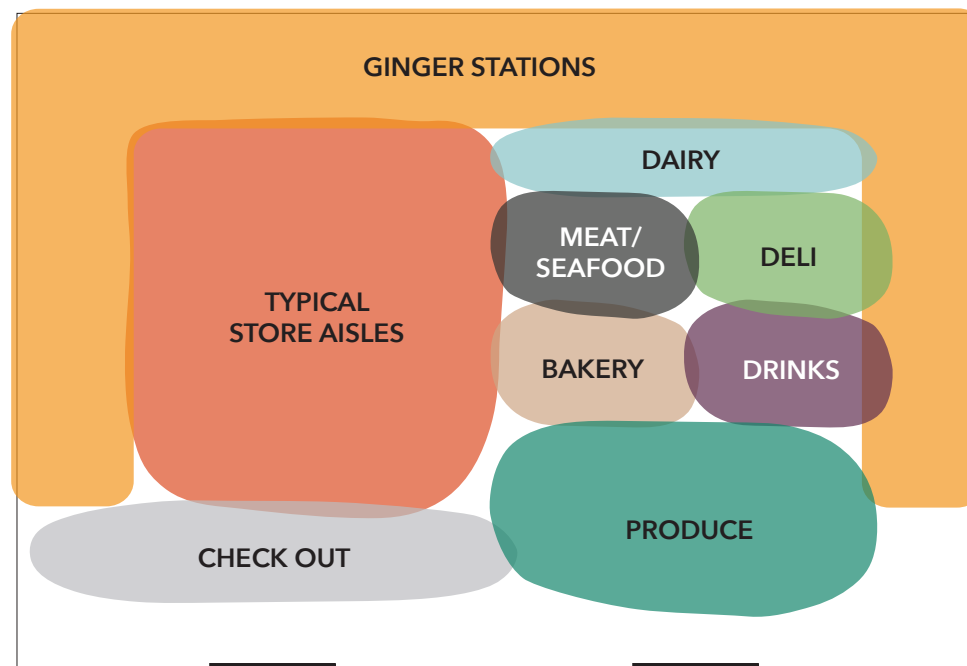
GINGER'S FLOOR PLAN



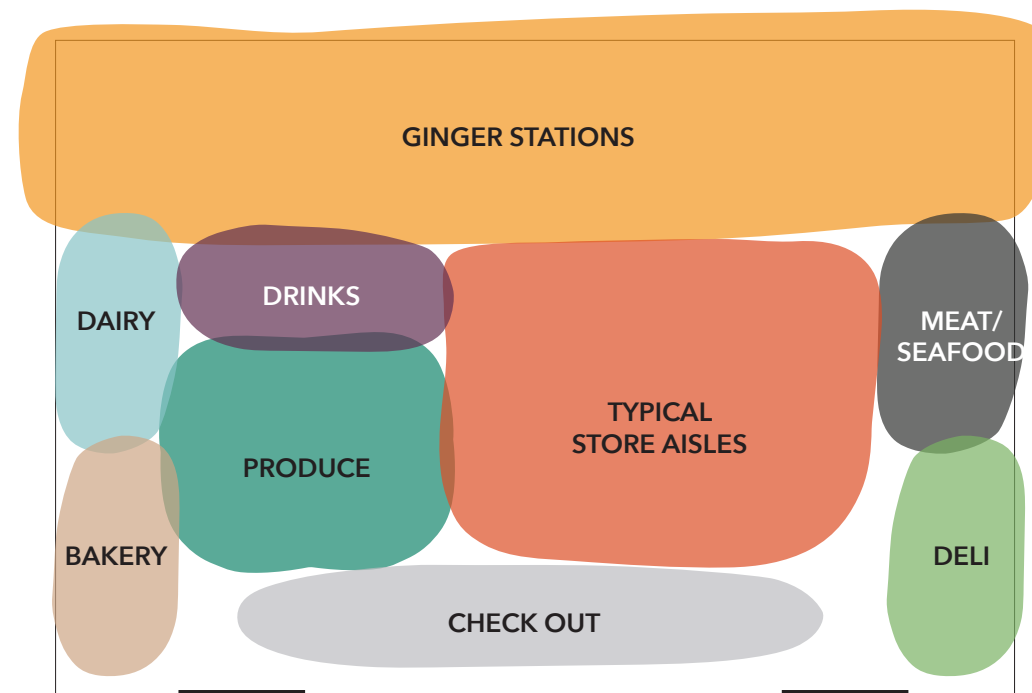
Bubble Diagrams

I created **three bubble diagram floor plans** based off my industry research. Each floor plan creates a different user journey for a Ginger shopper.

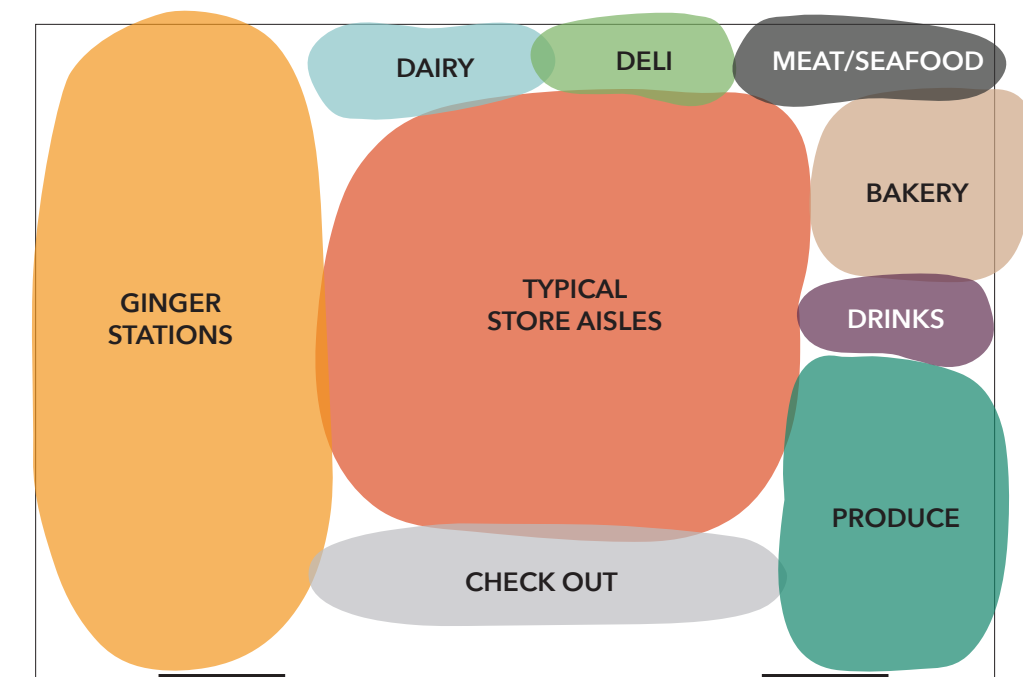
The Perimeter



The Back



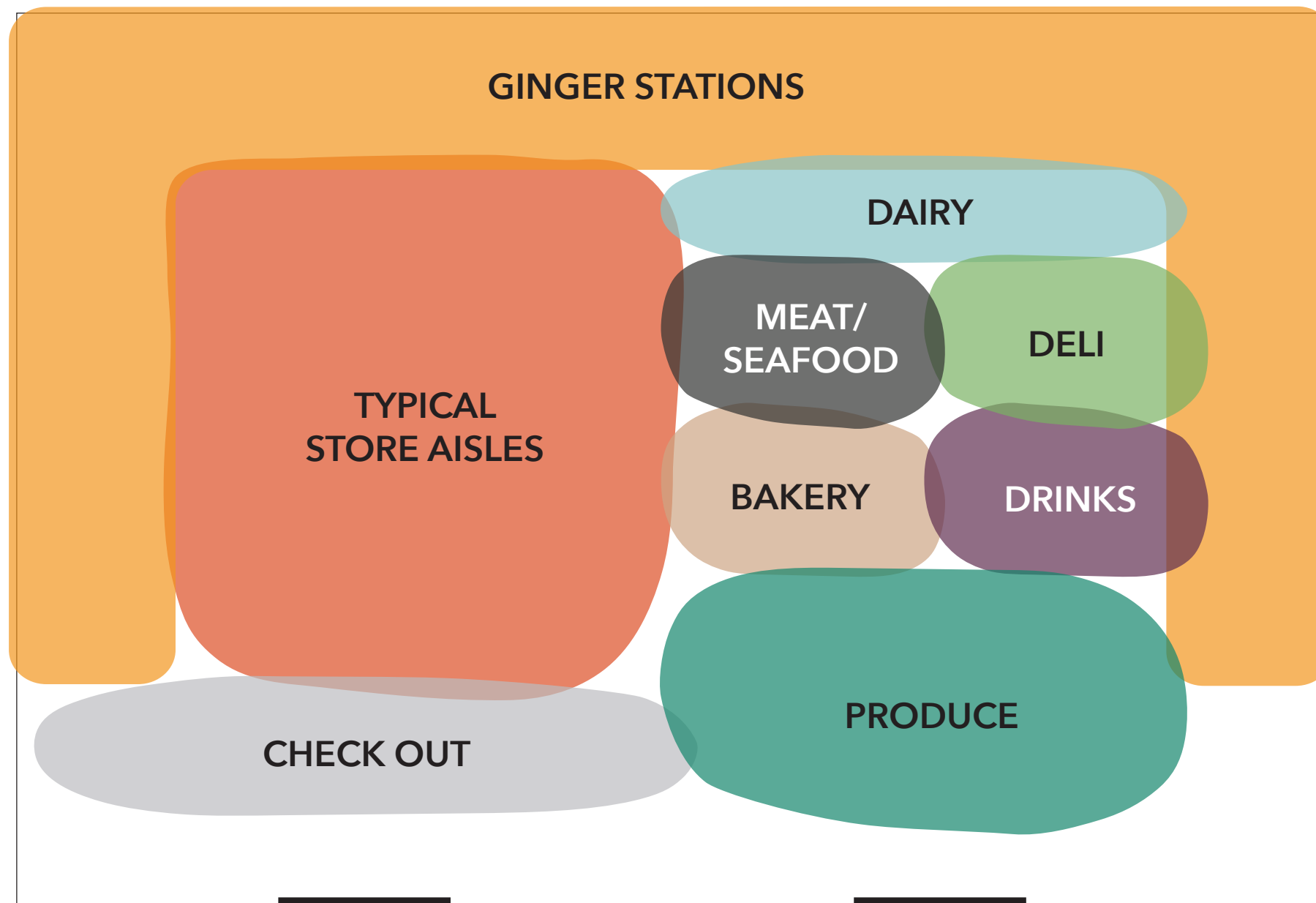
The Split



NOTE: Floorplan will serve as a guide for all Ginger stores and do not reflect any specific location or building dimensions

The Perimeter

This user journey would surround the perimeter of the store with meal-prep stations while centralizing the typical grocery store sections.



PROS

Encourages exploration

Some meal-prep stations are accessible for grab & go customers

CONS

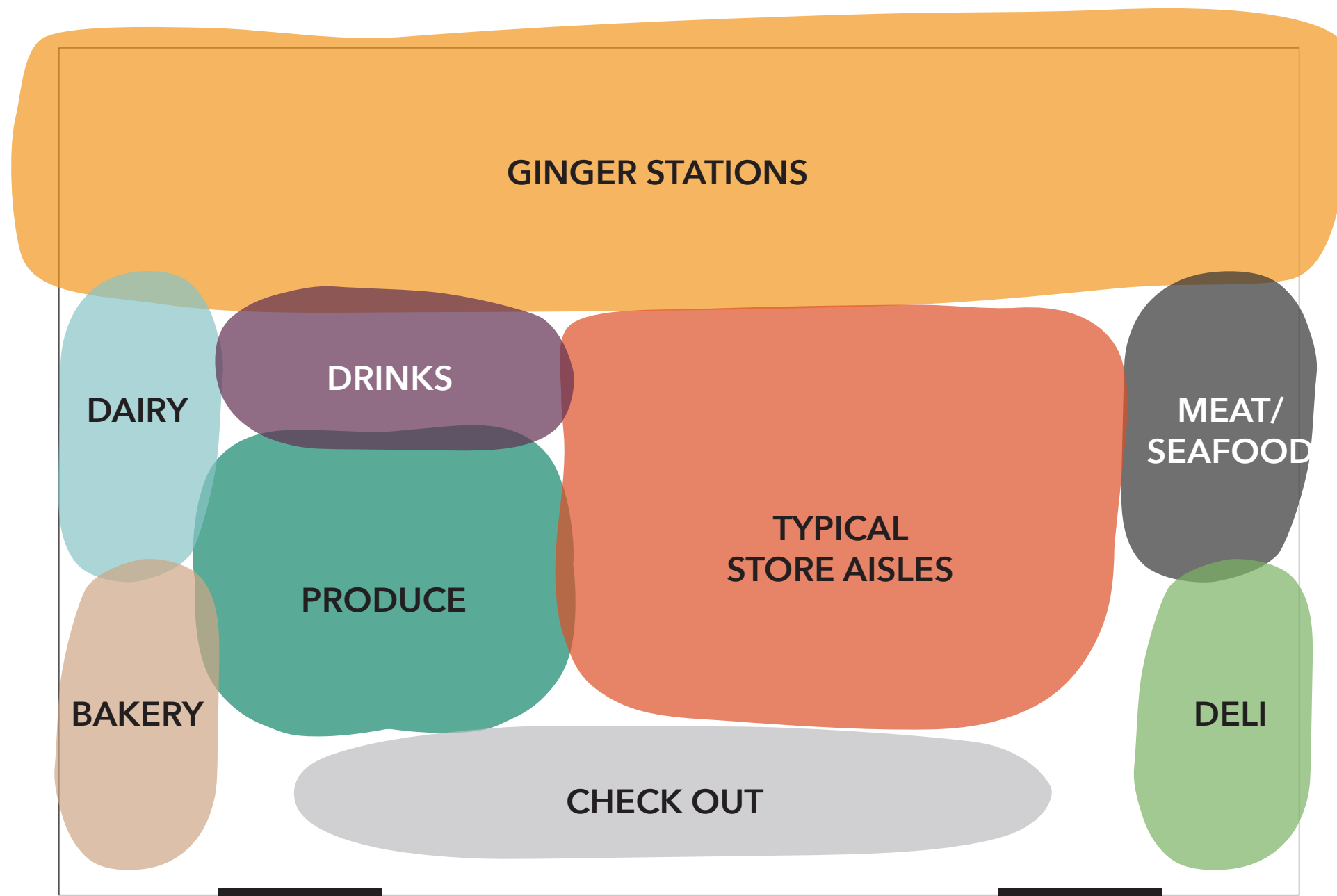
Allows for impulse purchases

Inefficient customer journey

Hard to temperature control sections

The Back

This user journey mixes up the traditional grocery store layout by adding Ginger's meal-prep stations along the back wall.



PROS

Easier navigation

Easy to temperature control sections

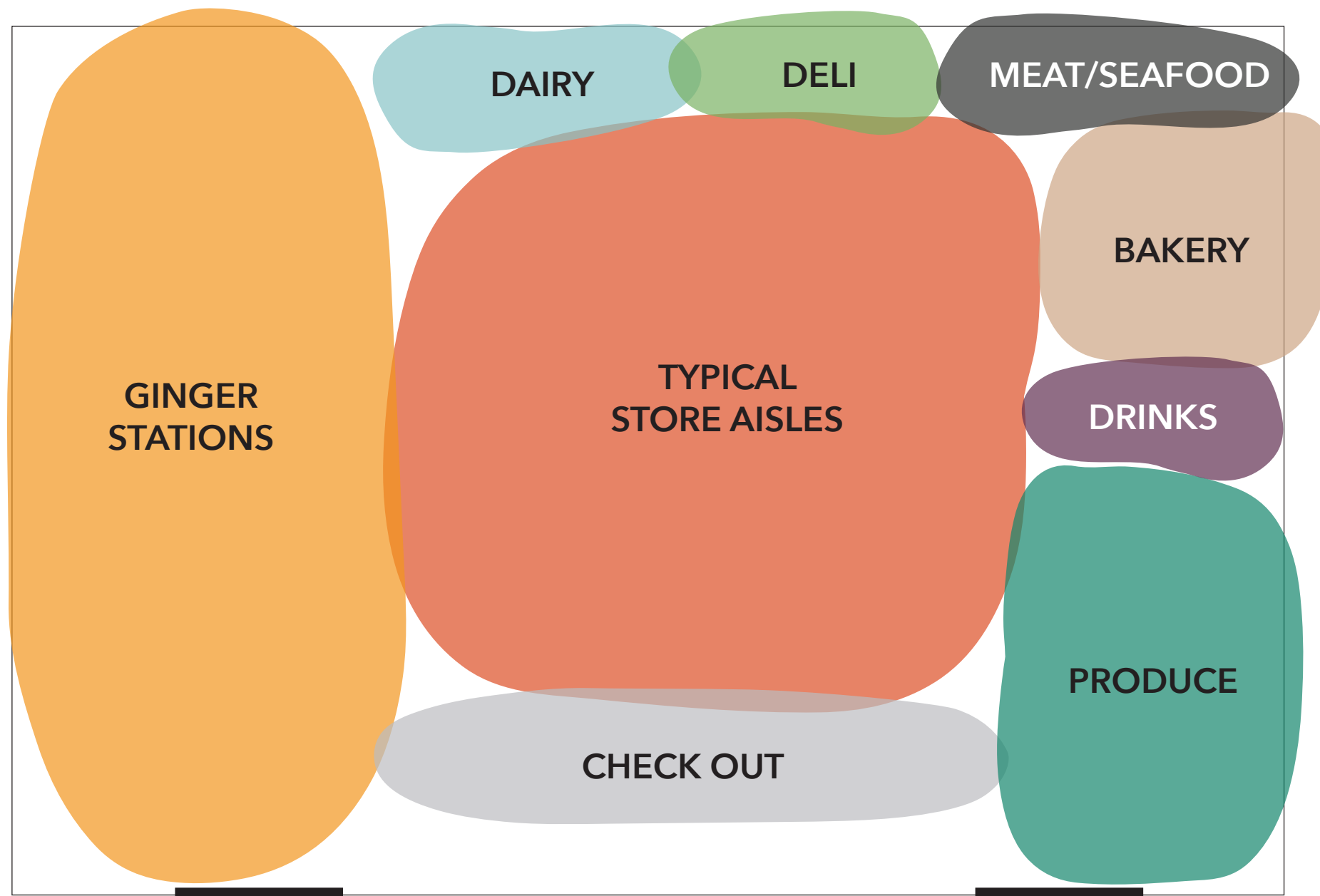
CONS

Meal-prep stations are less accessible for grab & go customers

Limits exploration

The Split

This user journey would give users the typical grocery store experience with the additional experience of meal-prep stations.



PROS

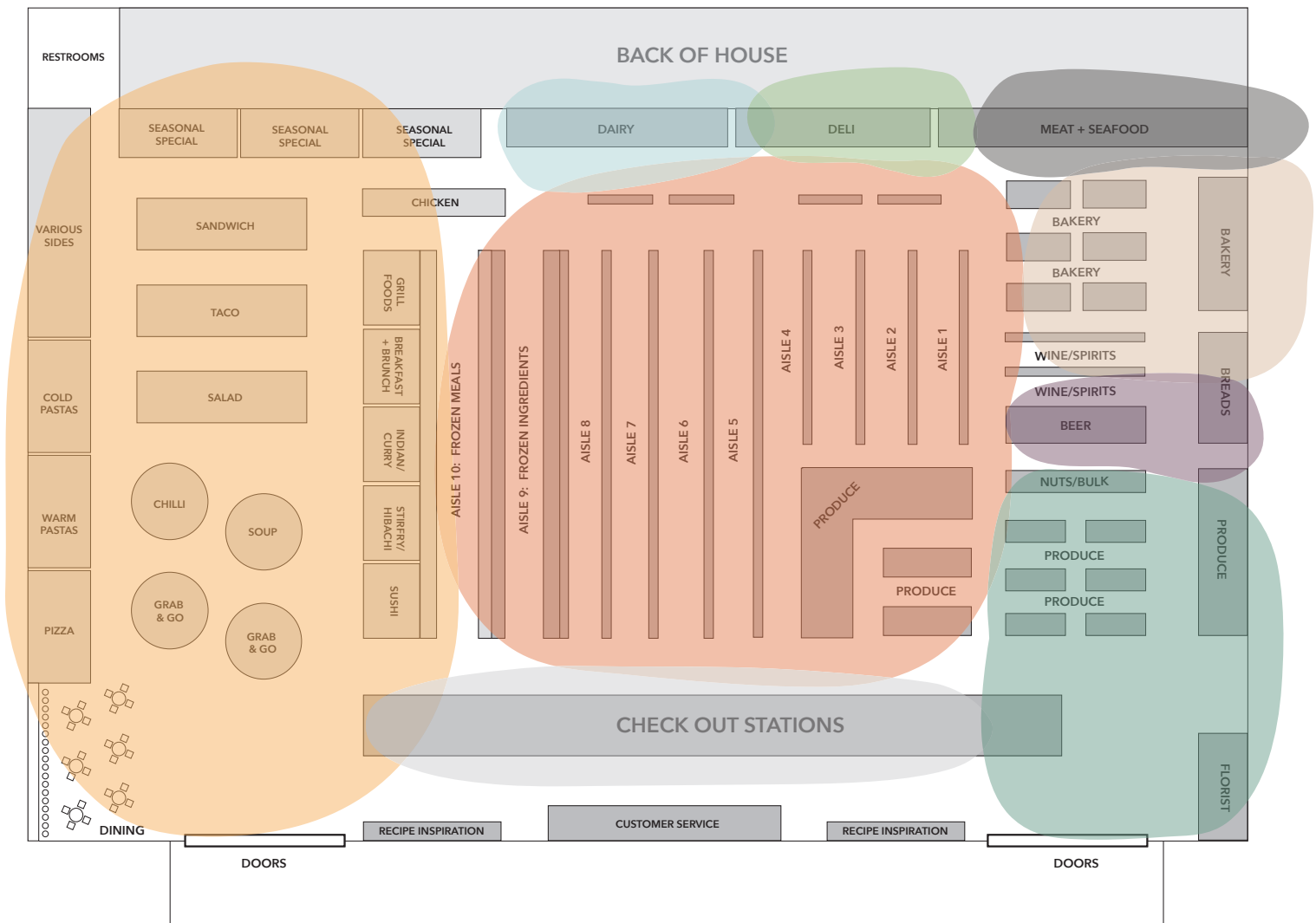
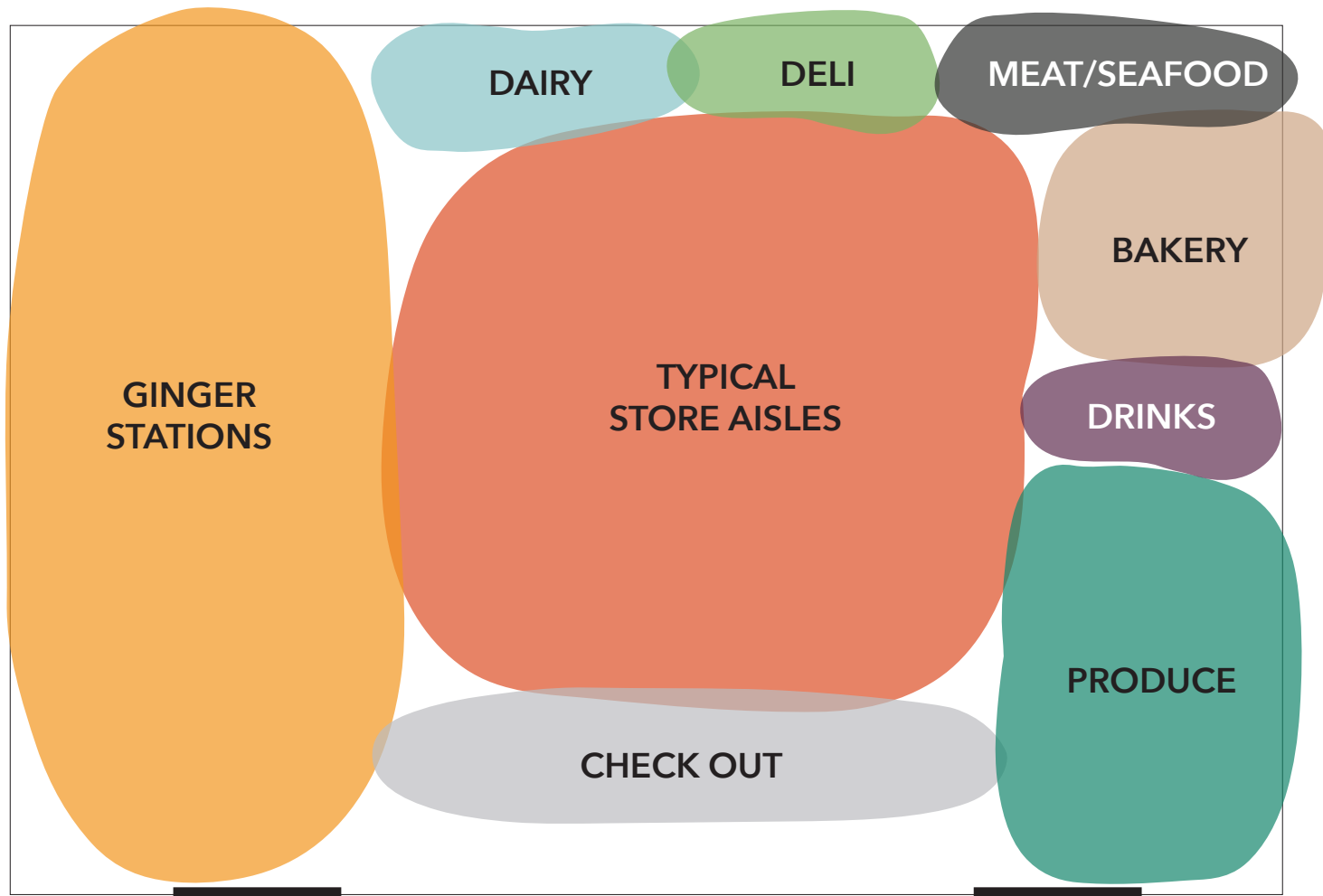
- Efficient user journey w/ easy navigation
- Easy to temperature control sections
- Consistent w/ average grocery layout
- Meal-prep stations are accessible for grab&go customers

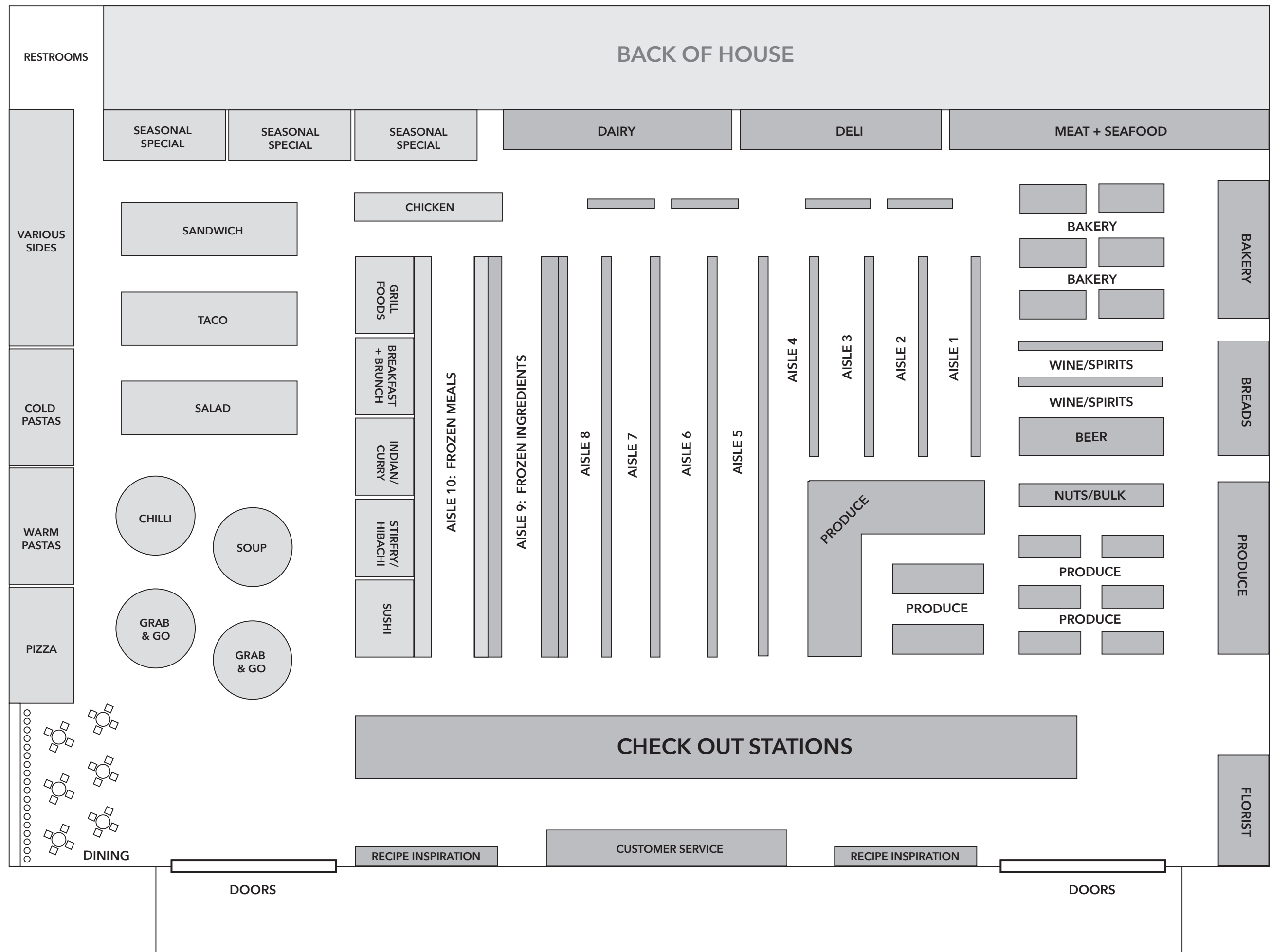
CONS

- Limits exploration

The Split Wins!

I turned the Split floorplan concept into a detailed floorplan concept that I could use to implement a graphic location plan for signage.







SIGNAGE PLAN

Signage Goals

Determining a graphic location plan for signage was based heavily off my industry research. My goals for signage include:

To use an appropriate amount of signage without overcrowding

To create an organized hierarchal system of signage

To educate, inspire and direct guests in a clear and kind manner

To establish an authentic, developed brand language

Signage Types

Ginger's graphic location plan includes the following types of signage:

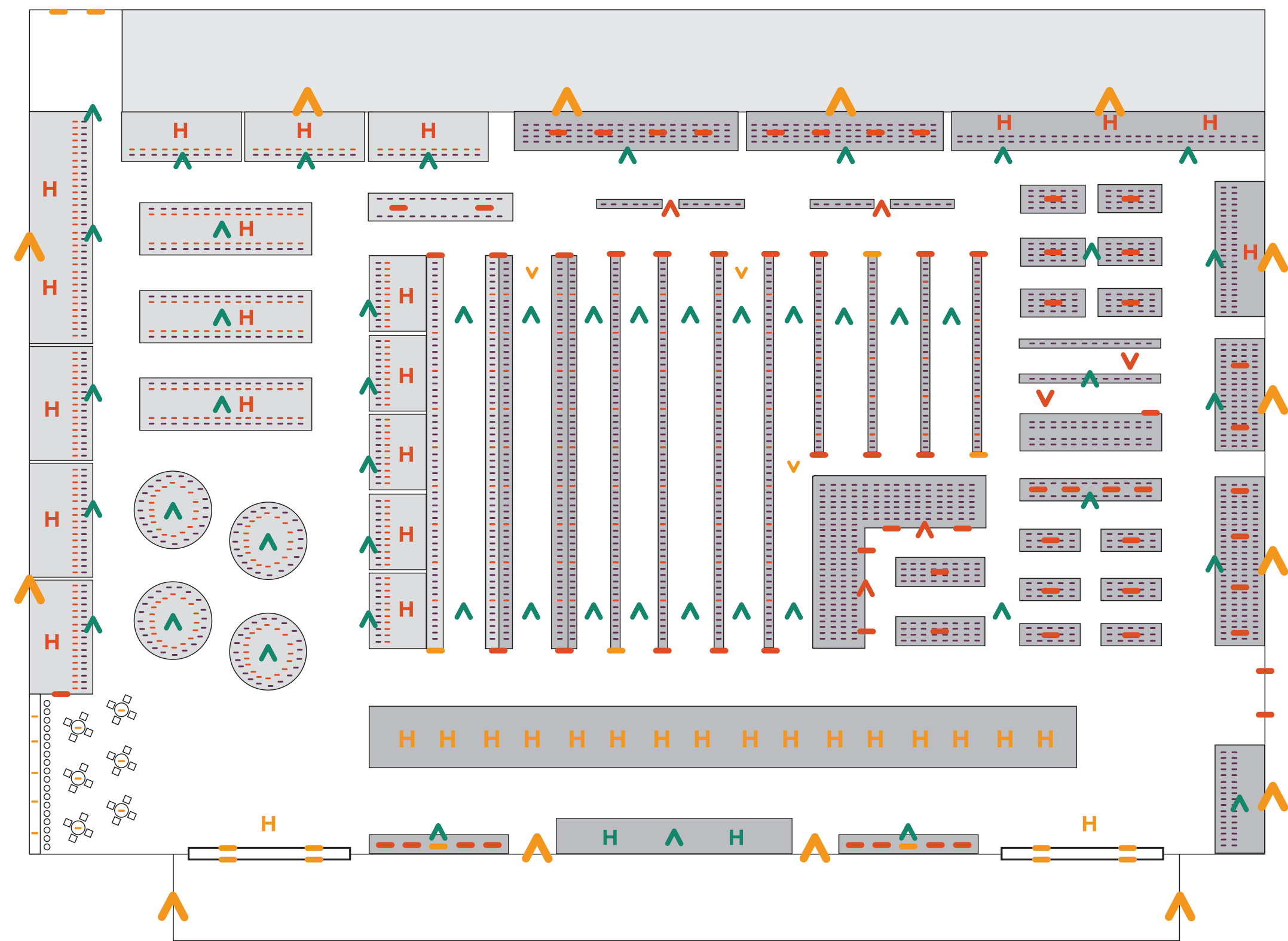
Directional Signage: Includes aisle navigation and additional wayfinding

Informational Signage: Includes product identification

Educational Signage: Includes food waste education & sustainable practices

Brand Signage: Includes brand loyalty & brand promotion

The Signage Plan



Key:

Directional
Informational
Educational
Brand

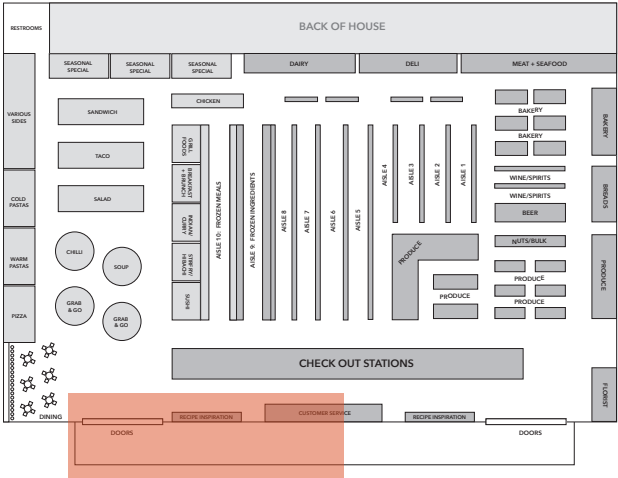
- High
- Eye-Level
- Low
- Human

Detail - One

The Entrance

Key:
Directional
Informational
Educational
Brand

^ High
- Eye-Level
v Low
H Human



Eye-level door signage to promote the mobile app

Door greeter to help direct and inform customer

H

High directional sign to guide customers to store resources

Store magazine & quick-grab recipe inspiration cards

^

Large brand graphics (could be directional too) on walls above aisle view

^

High directional sign to guide customers to customer service

Someone at desk

H

^

Large signage to welcome customers

^

Detail - Two

Meal Stations

Key:

Directional

Informational

Educational

Brand

^

High

—

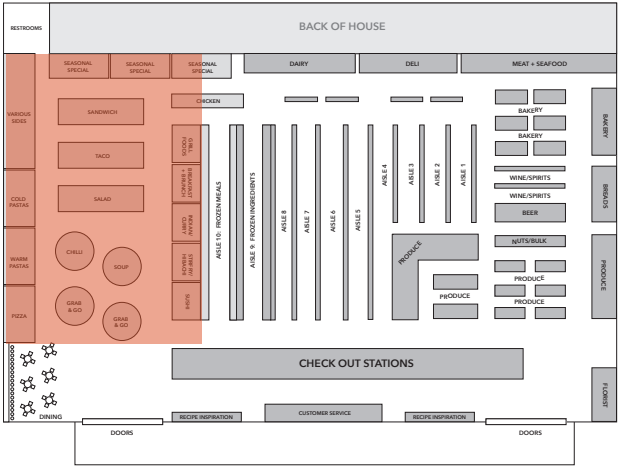
Eye-Level

v

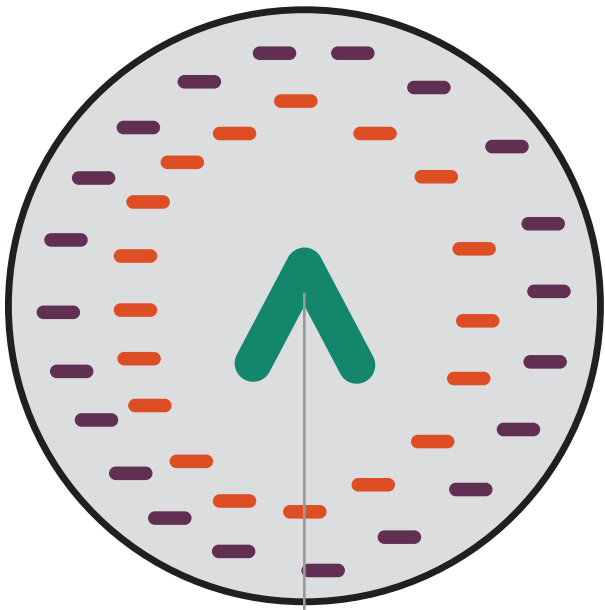
Low

H

Human

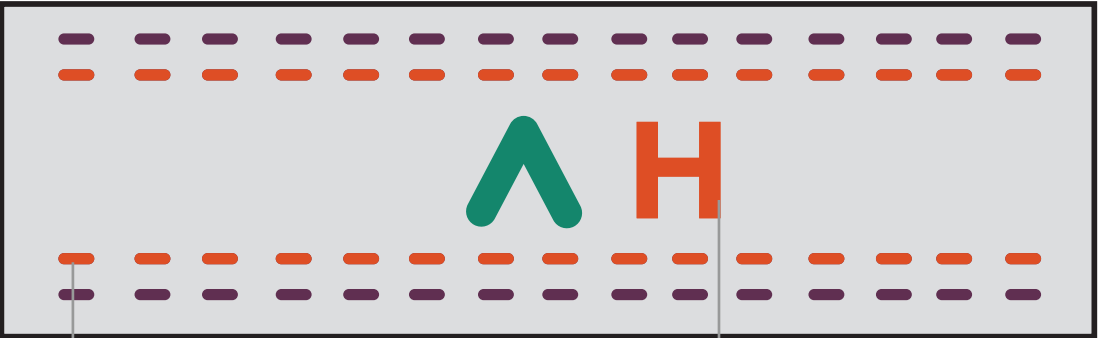


Self-serve island



Large, high directional sign to identify each meal station

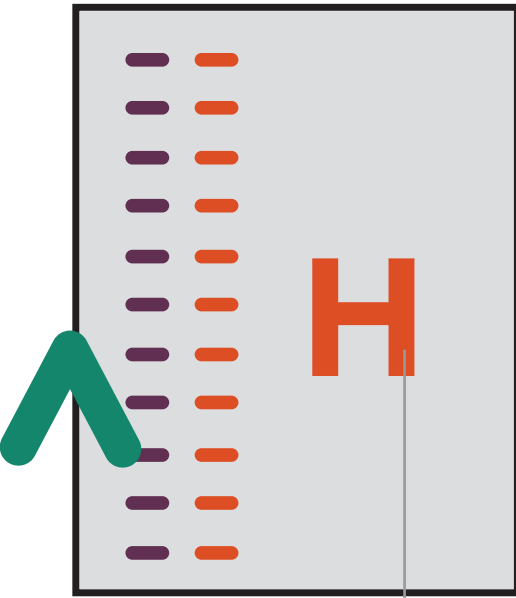
Employee assisted island



Food labeled with ingredients, nutrition, cooking & storing info, and portion size info. Ability to scan with app or grab a card with the same information

Islands are self-serve but employee is available for additional product information & education

Employee wall station

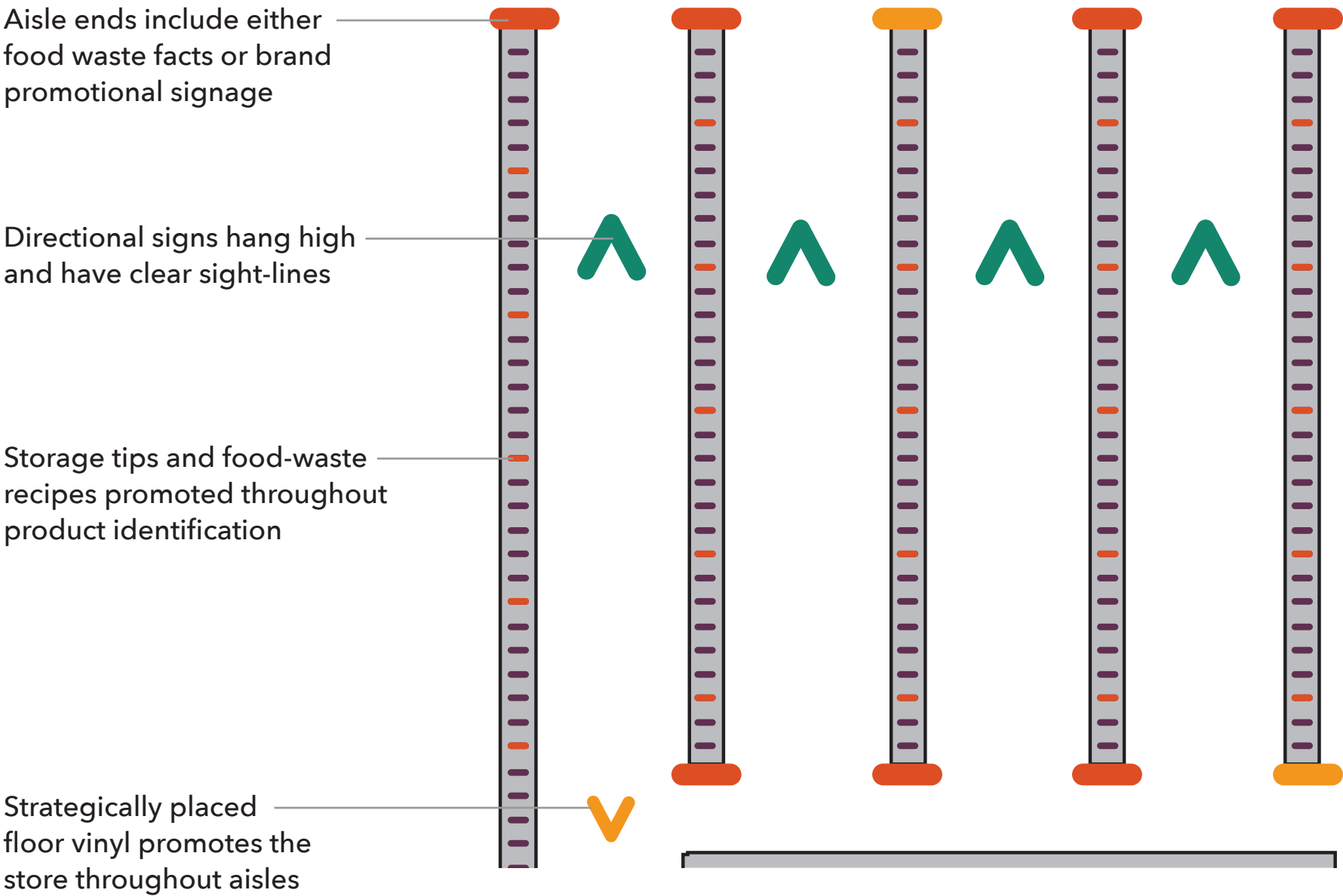
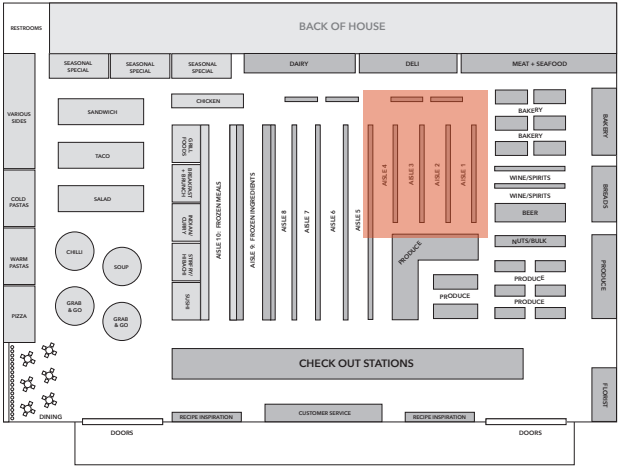


Employee serves food by portion sized scoops

Detail - Three

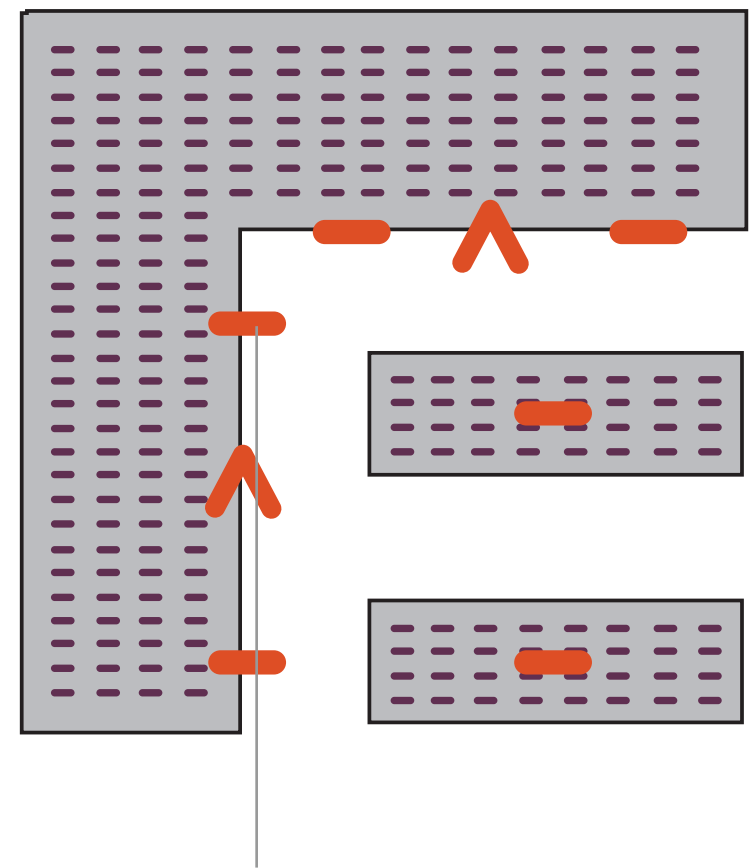
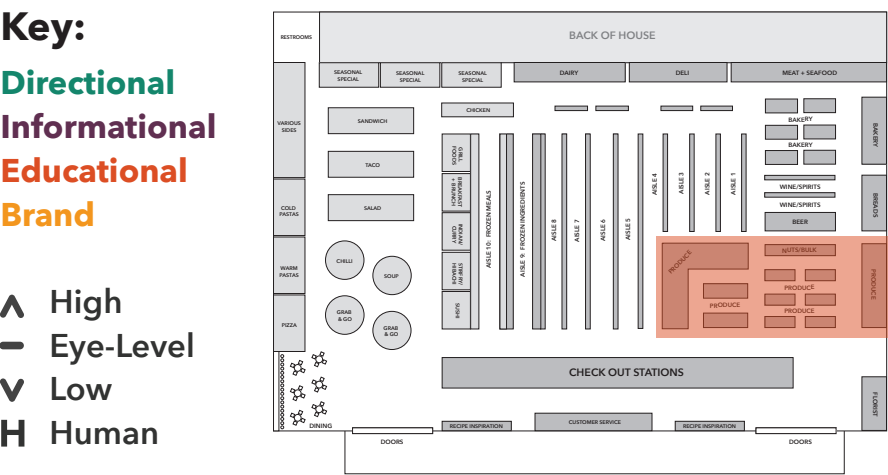
Main Aisles

- Key:
- Directional
 - Informational
 - Educational
 - Brand
- ^ High
— Eye-Level
v Low
H Human

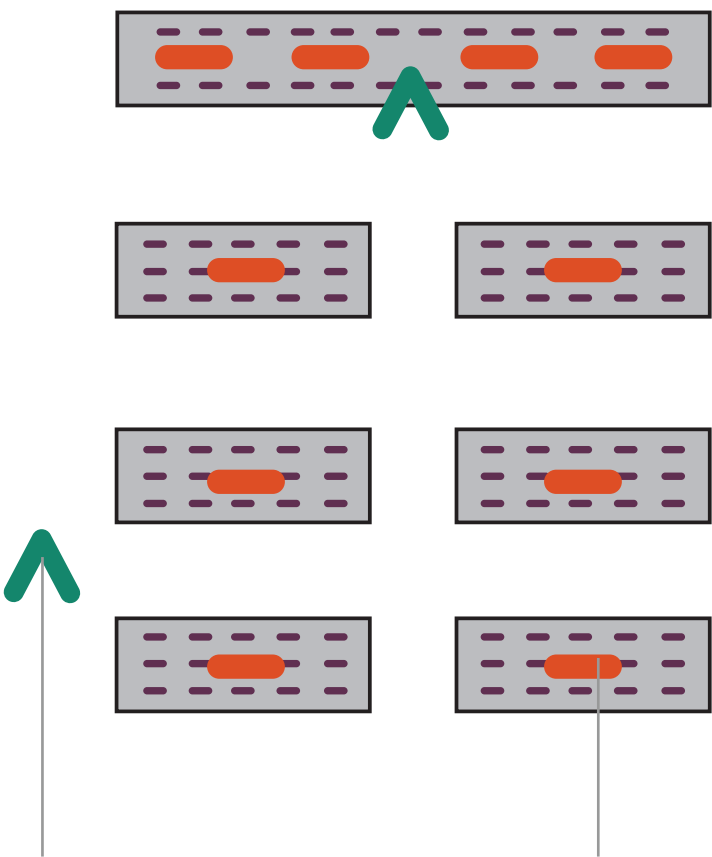


Detail - Four

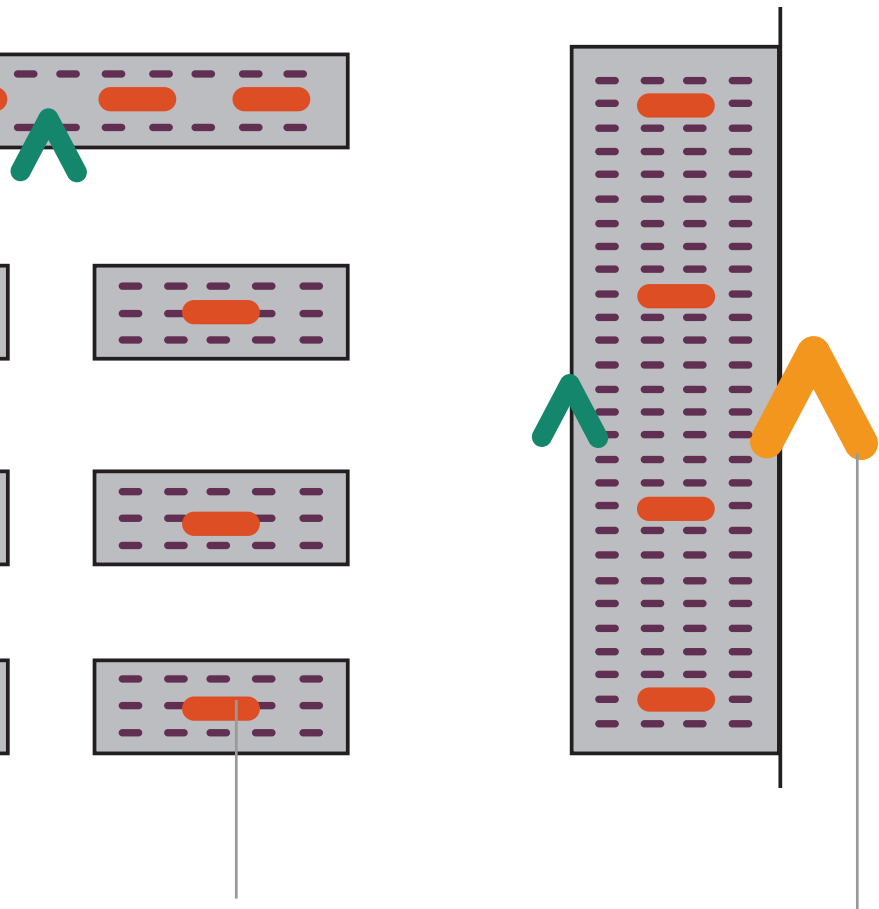
Fresh Sections - Produce



Fun produce storage tips & produce-past-its-prime advice promoted at different levels of hierarchy



High, directional signs identify sections of store



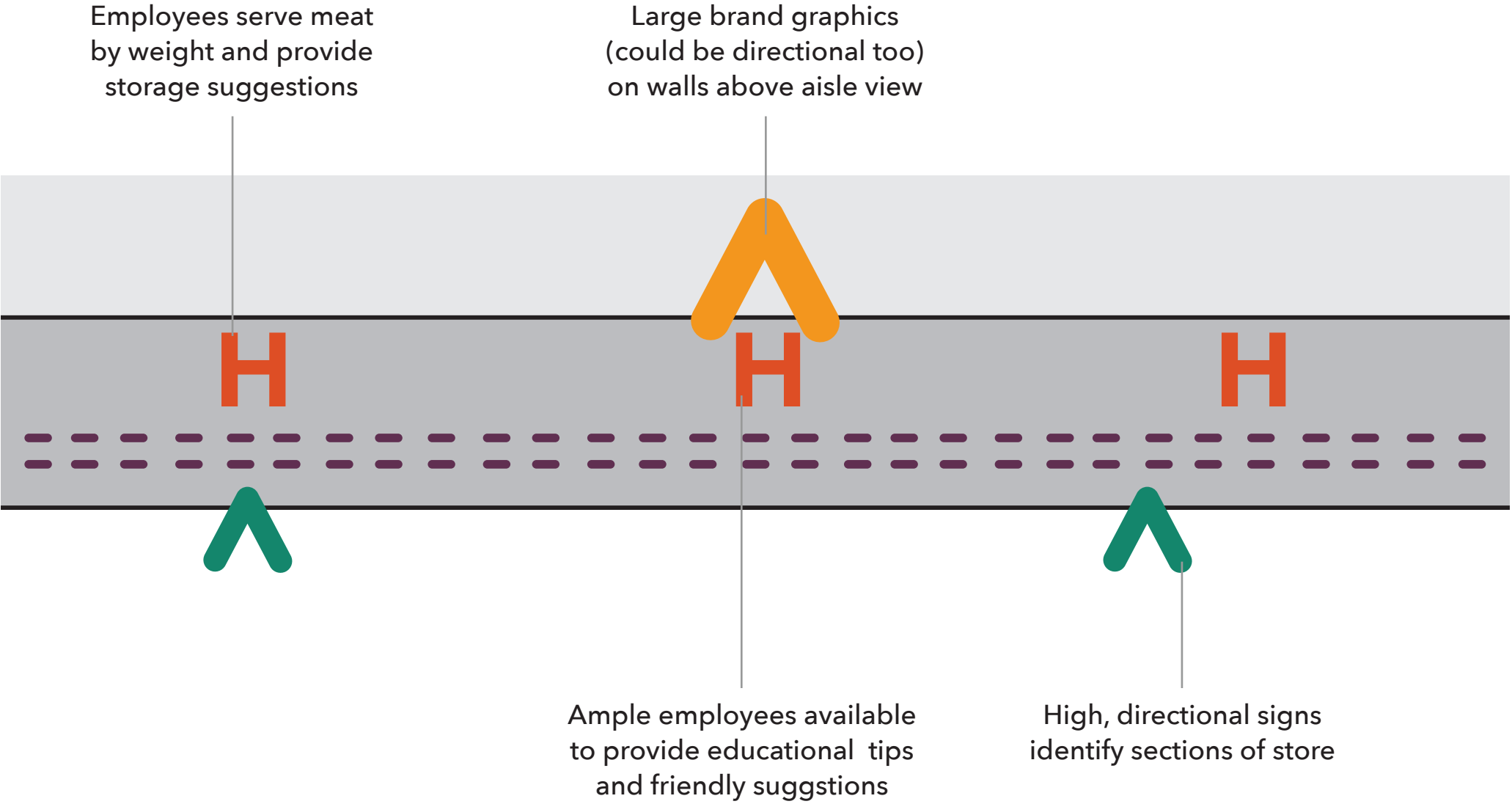
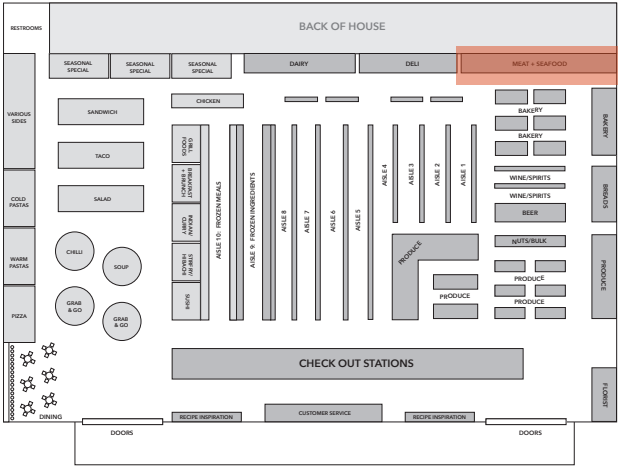
Education is extra important for produce and is presented in memorable ways

Large brand graphics (could be directional too) on walls above aisle view

Detail - Five

Fresh Sections - Meat & Seafood

- Key:
- Directional
 - Informational
 - Educational
 - Brand
- ^ High
- Eye-Level
v Low
H Human



NEXT STEPS

healthy living snacks

salty snacks

pretzels

Next Steps

To continue exploring the role of grocery stores in preventing food waste in the U.S., I have created a list of additional research for the future.

Test Ginger floorplan with real shoppers

User-test the floorplan layout and signage system with everyday shoppers to gain feedback, understand painpoints and make improvements.

Design Signage

Create appropriate signage designs to educate, inspire and help guests navigate the Ginger store based on additional signage research. Consider legibility and position in store.

Continue Research

Look deeper into the role of grocery stores in preventing food waste. Research powerful signage solutions, how to build customer loyalty and new solutions for reducing commercial food waste.

Research Sources

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